Soil Survey Investigations Report No. 5

Soil Survey Laboratory Data and

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Soil Survey Laboratory Data and Descriptions for Some Soils of...

...NEBRASKA

August 1966

SOIL CONSERVATION SERVICE · U.S. DEPARTMENT OF AGRICULTURE
In cooperation with
CONSERVATION AND SURVEY DIVISION · UNIVERSITY OF NEBRASKA

1. SAMPLE COLLECTION AND PREPARATION
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      2. Soil sampling
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   B. Laboratory preparation
      1. Standard (airdry)
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      3. Carbonate-containing material
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   A. Size-fraction base for reporting
      2. <size specified
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      tr: trace, not measurable by quantitative procedure used or less than reportable amount
      tr(s): trace, detectable only by qualitative procedure more sensitive than quantitative procedure used
      - : analysis run but none detected
      -(s): none detected by sensitive qualitative test
      blank: analysis not run
      nd: analysis not run
      <: less than reported amount or none present
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PREFACE

This publication is one in a new U.S. Department of Agriculture series established to preserve and make available technical information resulting from soil survey investigations. These investigations have been going on for about two decades. Data from them have been distributed in unpublished form to those immediately concerned. Some of the data and descriptions have appeared in technical journals, in regional bulletins, in USDA technical bulletins, and in the text of published soil surveys. But most were not available to all who might use them.

We intend to publish in this series all data from the soil survey laboratories that form reasonably complete characterizations of soils. Already-assembled data and descriptions will be published just as rapidly as they can be prepared for printing. Fragmentary data collected as reference points for specific soil surveys will not be included.

While these data were being assembled, there were many changes in laboratory methods. Some were improved and some new ones were devised. Consequently, laboratory data for different soils cannot always be directly compared without allowance for the method.

The method used is indicated by symbol in the column headings of the data table. These symbols are identified in the code sheet on the opposite page. Each method is described in the first number of this series, "Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples," SSIR No. 1.

Ways of describing soils have also changed. Soil descriptions have become explicit on more and more features. The systems for designating horizons and for classifying soils have been changed.

The soil descriptions published here were prepared as working documents to meet a specific need of a soil survey at the time the soil samples were collected. The soil scientists who wrote them had no idea they would be published. Editing has been limited for the most part to that necessary for conformance to the "Soil Survey Manual." Field textural estimates have been retained, even though some are at variance with the laboratory data, because the field estimates themselves are important data.

There were several reasons for sampling these soils. Some were sampled to study soil genesis, some to facilitate classification, and some to obtain data to permit more useful interpretations. Those sampled for genesis or classification studies do not always fit neatly into our present concepts of soil series. Partly because of these studies, our concepts of some soil series have been modified. As a consequence, the soil series name assigned a soil at the time of sampling is not always the name that would be assigned today. Soil series names in this publication follow 1965 series definitions.

Soil Survey
Soil Conservation Service

*Soil series names preceded by an asterisk are names of tentative series.

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Scotts Bluff	*Keota	S53Nebr-79-3	101
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	Mitchell	S53Nebr-79-4	125
	Mitchell	S53Nebr-79-2	127
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***Soil series names preceded by an asterisk are names of tentative series.**

Revised April 1964
April 1959

SOIL SURVEY LABORATORY Lincoln, Nebr.

SOIL TYPE Adair **LOCATION** Pawnee County, Nebraska

silty clay loam

SOIL NOS. S58Nebr-67-5 (S58(62)Nebr-67-5) **LAB. NOS.** 9162-9168 (17437-17444)

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)
0-5	A1p	0.6a	3.5a	6.4a	8.6a	5.2a	47.3	28.4	39.5	17.0	Tr.
5-10	B21	0.5a	3.0a	3.4a	4.2a	2.6a	38.9	47.4	26.6	17.2	Tr.
10-19	B22	0.6a	2.4a	3.2a	4.0a	3.1a	40.3	46.4	26.9	18.4	Tr.
19-28	B23	0.6a	2.2a	3.1a	3.9a	3.7a	43.2	43.3	29.1	19.7	Tr.
28-37	B24	1.1b	2.5b	2.8b	4.6b	4.2b	44.2	40.6	30.8	19.7	Tr.

Soil type: Adair silty clay loam
Soil No.: S58Nebr-67-5 and S58(62)Nebr-67-5 (revised)
Classification: Brunizem
Location: 170 feet south and 200 feet west of NE corner Sec. 29, T1N, R11E, about 2 miles west and 5 miles south of Pawnee City, Pawnee County, Nebraska.
Date sampled: September 15, 1958.
Collectors: J. S. Allen and J. A. Elder.
Use: Cultivated (alfalfa and brome).
Climate: Average annual precipitation 31 inches. Average annual temperature 53° F.
Physiography: Rolling glacial upland. Parent material: Glacial till.
Slope: 4 percent southwest.
Lincoln

Lab.No.	Horizon	
9162 (17437)	A1p	0-5 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) silty clay loam; moderate fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9163 (17438)	B21	5-10 inches. Dark reddish brown (5YR 3/3 dry) to dark brown (7.5YR 3/2 moist) silty clay; with common fine distinct reddish brown mottles; moderate fine blocky structure, continuous clay films on the aggregates; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9164 (17439)	B22	10-19 inches. Reddish brown (5YR 4/3 dry) to dark reddish brown (5YR 3/2 moist) clay with common fine distinct reddish brown mottles; moderate coarse prismatic primary to strong medium and fine blocky secondary structure; continuous clay films on the aggregates; plastic wet, firm moist, hard dry; noncalcareous; clear smooth lower boundary.
9165 (17440)	B23	19-28 inches. Reddish brown (5YR 4/4 dry) to dark reddish brown (5YR 3/3 moist) clay; common fine distinct dark reddish brown and dark brown mottles; moderate coarse prismatic primary to strong medium blocky secondary structure; continuous clay films and aggregates coated with dark material from above; plastic wet, very firm moist, hard dry; noncalcareous; gradual smooth lower boundary.
9166 (17441)	B24	28-37 inches. Yellowish red (5YR 5/6 dry) to dark reddish brown (5YR 3/4 moist) clay; moderate coarse prismatic primary to strong medium blocky secondary structure, continuous clay films on aggregates; plastic wet, very firm moist, hard dry; the soil matrix is noncalcareous with a few small lime concretions; clear smooth lower boundary.
9167 (17442)	B31	37-48 inches. Mottled strong brown (7.5YR 5/8 dry) to 75 percent dark brown (7.5YR 4/4 moist) and 25 percent dark reddish brown (5YR 3/4 moist) clay; moderate medium and coarse prismatic primary to strong medium blocky secondary structure; thin continuous clay films on aggregates; plastic wet, very firm moist, hard dry; the soil is noncalcareous but a few small hard lime concretions are present; gradual smooth lower boundary.
9168 (17443)	B32	48-60 inches. Reddish yellow (7.5YR 6/6 dry) to dark brown (7.5YR 4/4 moist) clay; strong medium prismatic primary to strong medium blocky secondary structure; thin continuous clay films on aggregates; plastic wet, firm moist, hard dry; common medium and fine dark brown iron and manganese concretions present. A few small lime concretions present, although the soil matrix is noncalcareous.
(17444)	B33	60-72 inches. Yellowish brown (10YR 5/6) clay loam with a few medium distinct light brownish gray mottles, and with prominent, patchy brown (7.5YR 5/4) illuviation cutans on planar surfaces and on pore walls; weak very coarse prismatic with prisms massive; firm; ruptures semiplastically at sampling moisture; slightly sticky and plastic; patches of black MnO_2(?) as coatings in a crude dendritic pattern on planar surfaces and as fairly complete coatings on the walls of some pores; black coatings appear to coat or interpenetrate with the illuvial clay cutans; occasional pocket and stringer of moved clay 1/8-inch thick; some of the thicker bodies of moved clay are very dark grayish brown.

Remarks: The pit was reopened in 1962 by George Holmgren, John Millet, Jim Drew and Robert Grossman. The sampling was extended downward 12 inches. Samples were taken for moisture retention, bulk density, and for mineralogical studies. The latter are to be done by John Millet as part of his Master of Science thesis project. The laboratory numbers in parentheses are for the 1962 samples.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Altvan loam, deep **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-11-(1-9) **LAB. NOS.** 5855-5863

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-6	A1p	8.3	12.1	6.5	8.1	14.8	33.4	16.8	38.4	13.7	8	l
6-8	A12	10.0	11.2	5.8	7.7	14.5	33.4	17.4	38.5	13.2	7	l
8-11	B1	8.4	10.0	5.1	6.4	11.8	33.7	24.6	35.2	13.4	7	l
11-17	B21	5.4a	8.1a	4.9a	5.6a	12.3a	36.4	27.3	37.0	14.9	3	cl
17-21	B22	3.6a	5.2a	3.1a	4.4a	16.1a	42.5	25.1	44.8	16.4	3	l
21-27	Bca	4.0a	5.5a	3.3a	6.3a	19.4a	39.6	21.4	47.0	15.8	3	l
27-32	C1	7.6b	10.4b	7.0a	11.1a	22.4a	26.4	15.1	46.2	9.6	6	fsl
32-36	D1	9.8b	15.4b	10.4a	14.4a	17.5a	18.1	14.4	36.5	7.3	15	cosl/sl
36-41	D2	40.4b	29.4b	7.5a	3.8a	1.4a	2.5	15.0	3.8	1.9	50	cosl

8C1b SATURATED PASTE	pH 8C1a 1:5	8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	GYPSUM meq./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.7	6.8	7.3	1.22	.108	11.3	<0.20	0.8	-				7.8
6.7	6.9	7.4	1.42	.108	13.1	<0.20	0.9	-				8.4
6.9	7.3	7.8	0.58	.063	9.2	<0.20	0.7	-				11.0
7.0	7.5	7.9	0.52	.059	8.8	<0.20	0.7	-				12.1
7.4	7.8	8.6	0.66	.078	8.5	<0.20	0.7	-				12.2
7.6	8.1	8.8	0.59	.068	8.7	<0.20	0.7	9				11.4
7.7	8.3	9.1	0.30			<0.20	0.8	8				7.7
7.8	8.4	9.2	0.25			<0.20	0.8	5				6.5
7.9	8.5	9.3	0.12			<0.20	0.8	6				6.2

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	5B1a EXCH. Na %	5D2	8A1 SAT. EXT. SOL. 6P1a Na	6Q1a K	4A3a Vol. Wt. g/cc	8A MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →							← milliequivalents per liter →			
14.9	10.1	2.3	3.5	-	1.8	-		0.3	1.7		37.3
15.3	11.0	2.3	2.3	-	1.8	-		0.3	1.7		35.4
18.3	13.1	3.3	2.0	-	1.7	-		0.3	1.0		42.7
20.6	14.6	4.4	2.0	-	1.7	-		0.2	0.9	1.45	49.4
24.6				-	1.9	-		0.3	0.8		50.9
18.9				-	1.6	-		0.2	0.9	1.27	46.9
14.2				-	1.7	-		0.5	1.2	1.54	32.4
11.8				0.1	1.6	1		0.6	1.4		29.1
11.0				0.2	1.5	2		1.6	1.4		23.8

a. Few irregular black concr. (Fe-Mn).
b. Few irregular black concr. (Fe-Mn) Also few, $CaCO_3$ concr.

Soil type: Altvan loam, deep
Location: Kimball County, Nebraska. 300 feet north and 65 feet west of SE corner Sec. 30, T16N, R57W. About 6 miles north of Bushnell, Nebraska.
Topography: About a 1 percent south facing slope on a loess-covered gravel Tertiary plain. Gravels assumed to be of Pleistocene age.
Cultivation: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-11-(1-9)
Lincoln

Lab.No.	Horizon	
5855	A1p	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5856	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary.
5857	B1	8-11 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) loam; weak coarse subangular blocky; friable, moist; clear smooth lower boundary.
5858	B21	11-17 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; broken clay skins on vertical and horizontal faces.
5859	B22	17-21 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) heavy silt loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; friable, moist; clear smooth lower boundary.
5860	Bca	21-27 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; disseminated lime occurring along structural faces and along root channels; few scattered gravels present; clear smooth lower boundary.
5861	C1	27-32 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) heavy fine sandy loam; massive structure; very friable, moist; violent effervescence; gradual smooth lower boundary; fine and coarse gravel mixed through horizon; a 2-inch Krotovina present, filled with dark colored surface material.
5862	D1	32-36 inches. Very pale brown (10YR 7/3 dry) to yellowish brown (10YR 5/4 moist) gravelly sandy loam; massive structure; very friable, moist.
5863	D2	36-41 inches. Pleistocene sand and gravel (5YR 6/4 moist) matrix; sticky uniform coarse sand.

Note: Numerous fine and coarse gravels present on the surface and throughout the profile. Horizons A1p, B21, and C1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

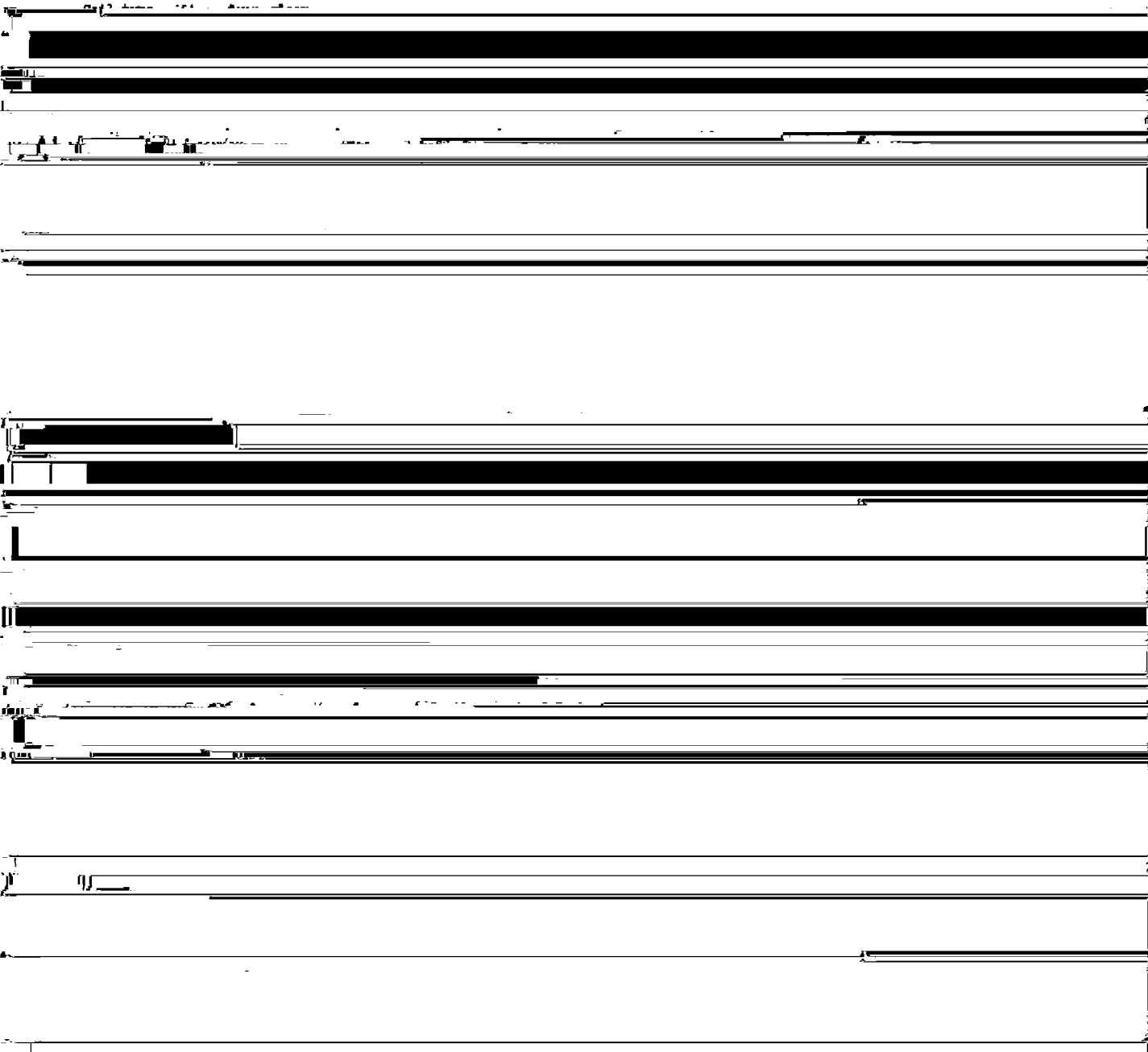
SOIL TYPE Altvan loam, deep **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-12-(1-9) **LAB. NOS.** 5864-5872

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2 mm	TEXTURAL CLASS
0-6	A1p	16.6	13.8a	5.4a	4.4a	11.4a	34.1	14.3	33.4	14.4	12	l
6-8	A12	12.1	14.3a	5.3a	4.9a	9.9a	34.9	18.1	32.3	14.5	11	l
8-12	B1	4.2	10.5a	5.6a	5.9a	12.6a	38.7	22.5	38.3	15.6	6	l
12-18	B21	6.6	5.6a	2.2a	2.4a	10.8a	41.0	31.4	36.3	16.6	3	cl
18-23	B22	2.3	2.4a	1.1a	1.6a	15.3a	50.6	26.7	47.0	19.9	2	sil
23-26	Bca	0.7b	1.8a	1.4a	1.9a	17.6a	56.6	20.0	51.1	24.3	1	sil
26-32	C1	2.7b	4.5a	2.9a	3.1a	17.8a	47.3	21.7	45.9	20.9	5	l
32-35	D1	24.4b	19.8a	8.4a	7.5a	7.8a	17.2	14.9	20.5	7.3	23	cosl
35-40	D2	42.2b	36.4a	9.8a	4.4a	0.9a	1.5	4.8	2.4	1.0	21	cos

8C1b pH SATURATED PASTE	8C1a pH 1:5	8C1a pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.5	6.6	7.2	1.12	.094	11.9	<0.20	0.5	-				7.2
6.4	6.7	7.2	0.77	.074	10.4	<0.20	0.6	-				8.2
6.6	7.0	7.4	0.52	.055	9.4	<0.20	0.6	-				9.9
6.7	7.1	7.8	0.56	.062	9.0	<0.20	0.5	7				13.8
7.2	7.7	8.4	0.58	.073	7.9	<0.20	0.7	5				13.4
7.7	8.3	9.1	0.61	.075	8.1	<0.20	0.7	7				13.3
7.8	8.5	9.2	0.37			<0.20	0.7	14				12.3
7.9	8.5	9.3	0.22			<0.20	0.8	16				7.1
3.1	8.7	9.4	0.02			<0.20	0.8	1				2.5

5A1a CATION	EXTRACTABLE CATIONS 6N2b	6O2b	6H1a	6P2a	6Q2a	5D2	8A1 SAT. EXT. SOIL. 6P1a	6Q1a	4A3a	8A MOISTURE



Topography: About a 1 percent slope on a loess-covered gravel Tertiary plain. Gravels assumed to be of Pleistocene age.
Cultivation: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-12-(1-9)
Lincoln

Lab.No.	Horizon	
5864	A1p	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5865	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary.
5866	B1	8-12 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) heavy loam; weak coarse subangular blocky structure; friable, moist; clear smooth lower boundary.
5867	B21	12-18 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; broken clay skins present on vertical and horizontal faces.
5868	B22	18-23 inches. Pale brown (10YR 6/3 moist) to brown (10YR 5/3 moist) heavy silt loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; friable, moist; abrupt smooth lower boundary.
5869	Bca	23-26 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) silt loam; weak

SCS-421
10-64

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Anselmo loamy fine sand SOIL Nos. S60Nebr-21-1 LOCATION Custer County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 13461-13466 December 1964

Depth (in.)	Horizon	1B1a Total Sand (2–0.05)	Total Silt (0.05–0.002)	Total Clay (< 0.002)	Sand: Very coarse (2–1)	Sand: Coarse (1–0.5)	Sand: Medium (0.5–0.25)	Sand: Fine (0.25–0.1)	Sand: Very fine (0.1–0.05)	Silt (0.05–0.02)	Silt: Int III (0.02–0.002)	Silt: Int II (0.2–0.02)	3A1 (2–0.1)			Coarse fragments: 2A2 ≥ 2	Coarse fragments: 2A2 2–19	Coarse fragments: 19–76
		Pct. of < 2 mm														Pct.	Pct. of < 76mm	
0-6	A1p	80.8	13.6	5.6	-	1.7	8.0	41.6	29.5	11.0	2.6	66.3	51.3			-	-	
6-11	A12	63.7	25.2	11.1	-	0.7	4.6	28.7	29.7	22.1	3.1	69.8	34.0			-	-	
11-22	AC	68.1	22.5	9.4	-	0.2	1.9	30.7	35.3	19.7	2.8	77.1	32.8			-	-	
22-38	C1	68.0	22.5	9.5	-	0.2	0.8	28.3	38.7	19.3	3.2	80.6	29.3			-	-	
38-50	C2	86.6	7.8	5.6	-	0.6	4.8	45.3	35.9	7.4	0.4	75.0	50.7			-	-	
50-60	C3	74.1	18.3	7.6	-	0.6	5.5	40.3	27.7	15.9	2.4	70.0	46.4			-	-	

Depth (in.)	6A1a Organic carbon	6B1a Nitrogen	6C1a C/N		6E1c Carbonate as $CaCO_3$	6C1a Ext. Iron as Fe_2O_3	Bulk density: 4A1a Field-State				Water content: 4B4 Field-State	4B1a 1/10-Bar Pieces	4B2 15-Bar			pH: 8C1a (1:1) H_2O
	Pct.	Pct			Pct	Pct.	g/cc	g/cc	g/cc		Pct	Pct	Pct.			
0-6	0.44	0.041	11			0.2							2.8			6.7
6-11	0.37	0.043	9			0.3	1.51				17.4	23.0	5.2			6.5
11-22	0.16	0.024				0.3							4.6			6.7
22-38	0.12	0.015			-	0.2	1.47				11.2	21.9	4.8			7.4
38-50	0.06				tr.	0.2							2.3			8.1
50-60	0.07				tr.	0.2							3.6			8.2

Depth (in.)	Extractable bases 5B1a: 6H2b Ca	6G2b Mg	6P2a Na	6Q2a K	Sum	6H1a Cat. Exch. Cap: Ext. Acidity	5A3a Sum Cations	5A1a NH_4OAc						8D3 Ca/Mg		Base saturation: 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g																
0-6	4.2	0.9	tr.	0.6	5.7	1.2	6.9	5.4								83	106
6-11	6.8	1.8	tr.	0.5	9.1	2.0	11.1	9.3						3.8		82	98
11-22	6.0	1.8	tr.	0.3	8.1	1.2	9.3	8.2						3.3		87	99
22-38	7.1	2.1	tr.	0.5	9.7	1.8	11.5	8.7						3.4		84	111
38-50			tr.	0.3				4.5									
50-60			tr.	0.5				6.7									

Depth (in.)	Ratios to Clay 8D1: NH_4OAc CEC		15-Bar Water
0-6	0.96		0.5
6-11	0.84		0.5
11-22	0.87		0.5
22-38	0.92		0.5
38-50	0.80		0.4
50-60	0.88		0.5

Soil type: Anselmo loamy fine sand
Soil No.: S60Nebr-21-1
Location: 190 feet east of center of west road and 300 feet north of center of road to south or 1050 feet south and 190 feet east of north 1/4 corner, Sec. 35, T20N, R22W, Custer County, Nebraska.
Physiography: Upland valley.
Relief: Undulating.
Slope: 2 to 3 percent; ridge top southeast slope.
Parent material: Eolian sands and silts.
Drainage: Good.
Permeability: Moderately rapid.
Land use: Cultivated; in corn.
Described by: Herbert L. Kollmorgen and John Elder, June 1960.

Horizon and Lincoln Lab. Number	
A1p 13461	0 to 6 inches. Very dark to dark grayish brown (10YR 3.5/2 moist) loamy fine sand; weak fine crumb breaking to single grained structure; very friable moist; no effervescence; abrupt smooth boundary. This surface texture is believed to be a fine sandy loam before wind erosion affected surface.
A12 13462	6 to 11 inches. Dark grayish brown (10YR 4/2 moist) fine sandy loam to very fine sandy loam; weak coarse and medium blocky breaking to weak fine subangular blocky structure; very friable moist; no effervescence; gradual wavy boundary.
AC 13463	11 to 22 inches. Grayish brown to dark grayish brown (10YR 4.5/2 moist) fine sandy loam; weak medium subangular blocky breaking to fine and very fine subangular blocky structure; very friable moist; many fine channels or pores and openings; no effervescence; gradual wavy boundary.
C1 13464	22 to 38 inches. Grayish brown (10YR 5/2 moist) fine sandy loam; weak coarse and medium subangular blocky breaking to single grained structure; very friable moist; no effervescence; gradual wavy boundary.
C2 13465	38 to 50 inches. Light brownish gray to grayish brown (10YR 5.5/2 moist) fine sand; single grained; loose moist; clear smooth boundary.
C3 13466	50 to 60 inches. Stratified dark grayish brown and grayish brown (10 percent 2.5Y 4/2 and 90 percent 10YR 5.5/2 moist) stratified very fine sandy loam and fine sandy loam; platy breaking to single grained structure; very friable moist; slight effervescence; gradual smooth boundary.

SOIL SURVEY LABORATORY Lincoln, Nebr. 5/24/57

SOIL TYPE Belfore silty clay loam **LOCATION** Cuming County, Nebraska

SOIL NOS. S-55-Nebr-20-1-(1-8) **LAB. NOS.** 2824-2831

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-7	A1p	-	0.1	0.1	0.2	3.0	61.2	35.4	40.9	23.4	-	sicl
7-14	A12	-	0.1	0.1	0.2	1.7	58.9	39.0	33.4	27.3	-	sicl
14-19	B1	-	0.1	-	0.2	1.7	57.1	40.9	30.7	28.2	-	sic
19-25	B21	-	0.1	0.1	0.2	1.7	57.9	40.0	32.3	27.4	-	sic/sicl
25-39	B22	-	-	0.1	0.2	2.2	61.0	36.5	36.1	27.2	-	sicl
39-48	B23	-	-	-	0.2	3.4	63.4	33.0	40.8	26.1	-	sicl
48-55	B3	-	-	0.1	0.3	4.1	63.2	32.3	41.8	25.6	-	sicl
55-60	C	-	0.1	0.1	0.3	5.3	64.6	29.6	46.8	23.3	-	sicl

pH 8C1a 1:1	1:5	1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM @25°C.	$CaCO_3$ equivalent %	GYPSUM mc./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
5.8	6.1	5.9	2.41	.213	11.3							14.2
5.9	6.2	6.3	1.80	.163	11.0							16.1
6.0	6.2	6.5	1.10	.102	10.8							16.8
6.1	6.3	6.4	0.75	.070	10.7							16.7
6.0	6.4	6.6	0.50									15.9
6.3	6.3	6.4	0.35									15.1
6.4	6.5	6.7	0.21									15.3
6.5	6.6	6.8	0.22									14.6

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a 6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K	BASE SAT. %	4A3a Vol. Wt. g/cc	MOISTURE AT SATURATION %
← milliequivalents per 100g. soil →						5C1		
28.2	17.1	6.5		0.1	1.3	89		
28.8	17.3	6.6		0.1	0.7	86	1.18	
29.9	18.8	7.9		-	0.6	91		
30.4	19.3	8.5		0.1	0.6	94		
29.1	18.9	8.1		0.1	0.6	95	1.42	
27.1	18.2	7.6		0.3	0.5	98		
27.3	18.7	7.0		0.2	0.5	97		
26.5	18.7	7.4		0.2	0.4	100	1.25	

Soil type: Belfore silty clay loam
Soil No.: S55Nebr-20-1-(1-8)

[redacted]

Physiography: Nearly level plain; 1/2 to 1 percent southeast 1/2-mile long slope; about 200 feet north of shallow swale-like drain.
Use: Cultivated, corn.
Collected by: D. W. DeMoude, H. L. Kollmorgen, B. H. Williams, J. A. Elder, R. D. Greenawalt, T. F. Clapper and J. S. Allen, July 1955.
Described by: B. H. Williams

Horizon and
Mandan
Lab. Number

[redacted]

SOIL SURVEY LABORATORY Lincoln, Nebr. 5/24/57

SOIL TYPE Belfore silty clay loam LOCATION Cuming County, Nebraska

SOIL NOS. S-55-Nebr-20-2-(1-9) LAB. NOS. 2832-2840

DEPTH INCHES	HORIZON	1Bla PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3Al									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-7	A1p	-	0.1	0.1	0.2	3.1	60.5	36.0	38.8	24.9	-	sicl

Soil type: Belfore silty clay loam
Soil No.: S55Nebr-20-2-(1-9)
Location: 600 feet north and 150 feet east of southwest corner Sec. 33, T24N, R6E, Cuming County, Nebraska; 3 miles east and 5 miles north of Beemer, Nebraska, just north of Wisner-Bancroft road, about midway between the two towns.
Physiography: Nearly level plain; less than 1 percent slope to the southeast.
Use: Cultivated, corn.
Collected by: D. W. DeMoude, H. L. Kollmorgen, B. H. Williams, J. A. Elder, R. D. Greenawalt, T. F. Clapper and J. S. Allen, July 1955.
Described by: B. H. Williams.

Horizon and Mandan Lab. Number	
Alp 2832	0 to 7 inches. Very dark grayish brown to very dark brown (10YR 3.5/1.5 dry to 2/1.5 moist) silty clay loam; weak fine and very fine granular; soft, dry; friable, moist; abrupt smooth lower boundary.
A12 2833	7 to 12 inches. Very dark grayish brown to very dark brown (10YR 3.5/2 dry to 2/2 moist) silty clay loam; very weak coarse prismatic and moderate medium and fine granular structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
B1 2834	12 to 17 inches. Dark grayish brown to very dark grayish brown (10YR 4/2 dry to 2.5/2 moist) silty clay loam; weak coarse prismatic and moderate fine and very fine blocky and fine granular structure; hard, dry; firm, moist; smooth clear lower boundary.
B21 2835	17 to 24 inches. Dark brown (10YR 4.5/3 dry to 3/3 moist) heavy silty clay loam; moderate coarse prismatic to moderate and strong fine and medium blocky structure; weak to moderate glaze on peds; hard, dry; firm, moist; plant roots common to many in this horizon and ones above; clear smooth lower boundary.
B22 2836	24 to 33 inches. Brown to dark brown (10YR 5.5/3 dry to 3.5/2.5 moist) silty clay loam; few faint fine gray and yellowish brown mottles and very dark brown iron-manganese soft concretions; moderate coarse prismatic and moderate medium and fine blocky structure; moderate glaze on peds; hard, dry; firm, moist; plant roots few to common; clear smooth lower boundary.
B23 2837	33 to 40 inches. Light yellowish brown to light olive brown (2.5Y 6/3 dry to 5/4 moist) silty clay loam; common medium distinct gray and yellowish brown mottles and dark brown to black iron-manganese soft concretions; moderate coarse prismatic and weak medium and fine blocky structure; moderate glaze on peds; hard, dry; firm, moist; only a few living plant roots in this horizon; clear smooth lower boundary.
B3 2838	40 to 47 inches. Light yellowish brown to light olive brown (2.5Y 6/4 dry to 5/4 moist) silty clay loam; many fine distinct gray and yellowish brown mottles and dark brown fine iron-manganese soft concretions; weak coarse prismatic structure; little or no horizontal cleavage; weak thin discontinuous glaze on vertical prism faces; hard, dry; firm to friable, moist; no living plant roots but old root channels common to many; noncalcareous; clear smooth lower boundary.
C 2839	47 to 54 inches. About equal amounts of 2.5Y 7/2, 7/4 and some 10YR 7/6 dry to about equal amounts of 2.5Y 6/2, 5/4 and 5/6 and some 10YR yellowish brown and dark brown, moist, coloring silty clay loam; massive; slightly hard, dry; friable, moist; many fine very dark brown iron-manganese soft concretions; old root channels and pores common; noncalcareous; clear smooth lower boundary.
Cca 2840	54 to 60 inches. Light yellowish brown to light olive brown (2.5Y 6/3 dry to 5/4 moist) silty clay loam or heavy silt loam; common distinct fine gray and strong brown mottles and very dark brown iron-manganese streaks and soft concretions; massive; calcareous; strong effervescence; mycelial and fine soft concretionary lime and a few hard lime concretions 2 to 4 mm. in diameter; many old root channels and pores, some of which are lined with or filled with lime carbonate.

Horizons Alp, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/22/55

SOIL TYPE Belfore silty clay loam **LOCATION** Madison County, Nebraska

SOIL NOS. S54Nebr-60-1-(1-8) **LAB. NOS.** 2202-2209

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	3A1 0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-7	A1p	-	0.1	0.3	1.0	7.6	55.1	35.9	42.8	20.6	-	sicl
7-10	A12	-	-	0.1	0.3	5.4	51.8	42.4	37.9	19.5	-	sic
10-21	B1	-	-	0.2	0.4	5.9	50.6	42.9	36.7	20.1	-	sic
21-32	B21	-	-	0.1	0.3	6.2	55.7	37.7	41.8	20.3	-	sicl
32-38	B22	-	0.1	0.1	0.4	6.6	58.2	34.6	44.8	20.3	-	sicl
38-44	B3	-	0.1	0.2	0.7	9.5	57.8	31.7	47.6	20.1	-	sicl
44-57	C	-	-	0.1	0.4	7.3	61.2	31.0	45.2	23.5	-	sicl
57-62	Cca	0.2	0.1	0.2	0.5	9.0	64.7	25.3	48.5	25.6	-	sil

DEPTH INCHES	HORIZON	pH 8C1b SATURATED PASTE	pH 8C1a 1:5	pH 8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON	ORGANIC MATTER 6B1a NITROGEN	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10^3	6E1a $CoCO_3$ equivalent	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS.	MOISTURE TENSIONS 1/3 ATMOS.	4B2 15 ATMOS.
0-7	A1p													
7-10	A12													
10-21	B1													
21-32	B21													
32-38	B22													
38-44	B3													
44-57	C													
57-62	Cca													

Soil type: Belfore silty clay loam
Soil No.: S54Nebr-60-1-(1-8)
Location: .2 mile east and 150 feet north of southwest corner Sec. 32, T22N, R2W; about 6 miles west of Madison, Madison County, Nebraska.
Topography: 1 percent east or northeast facing slope on gently undulating plain remnant.
Use: Cultivated, corn 1954.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2202	A_{1p}	0-7"	Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2.5/2, moist) silty clay loam; moderate very fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
2203	A_{12}	7-10"	Very dark grayish brown (10YR 3/2.5, dry) to very dark brown (10YR 2/2.5, moist) silty clay loam; strong fine granular structure; soft, dry; very friable, moist; clear smooth lower boundary.
2204	B_1	10-21"	Dark brown (10YR 4/3, dry) to dark brown (10YR 3/3, moist) heavy silty clay loam; compound weak coarse prismatic, moderate coarse subangular blocky and strong very fine subangular blocky or fine and medium granular structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
2205	B_{21}	21-32"	Brown (10YR 5/3, dry) to brown (10YR 4/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and strong coarse and medium blocky structure with moderate glaze on blocks and some very dark brown staining along vertical cleavage planes; hard, dry; firm, moist; gradual smooth lower boundary.
2206	B_{22}	32-38"	Brown (10YR 5/3, dry) to dark brown (10YR 4/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and strong coarse blocky structure with moderate glaze on blocks and some very dark brown staining along vertical cracks; hard, dry; firm, moist; gradual wavy lower boundary.
2207	B_3	38-44"	Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 4.5/4, moist) silty clay loam; a few faint fine gray and brown mottles; moderate coarse blocky structure; hard, dry; friable, moist; gradual wavy lower boundary.
2208	C	44-57"	Pale yellow (2.5Y 7/4, dry) to yellowish brown (10YR 5/4, moist) heavy silt loam; few prominent gray brownish yellow and strong brown mottles and a few very dark brown iron-manganese spots; massive, but with some tendency to weak coarse subangular blocky structure; slightly hard, dry; friable, moist; numerous pores and fine, thread-like channels; no roots apparent; gradual wavy lower boundary.
2209	C_{ca}	57-62"	Pale yellow (2.5Y 7/4, dry) to light yellowish brown (10YR 5.5/4, moist) silt loam; mottles about as in horizon above; massive; soft, dry; very friable, moist; calcareous, but effervesces only on lime spots and concretions in the upper part; moderate to strong effervescence throughout in the lower part.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 2/20/55

SOIL TYPE Belfore silty clay loam **LOCATION** Platte County, Nebraska

SOIL NOS. S54Nebr-71-1-(1-8) **LAB. NOS.** 2194-2201

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1								2A2	TEXTURAL CLASS
		VERY COARSE	COARSE	MEDIUM	FINE	VERY FINE					

Soil type: Belfore silty clay loam
Soil No.: S54Nebr-71-1-(1-8)
Location: 100 feet east and 100 feet south of north quarter corner, Sec. 31, T20N, R2W; Platte County, Nebraska.
Topography: About 1 percent south facing slope--broad undulating and gently sloping plain.
Use: Cultivated, corn 1954; rotation with small grain and red clover in alternate years except alfalfa for a period of 3 or 4 years out of each 15. Corn yields about 60 bushels maximum, as low as 8 or 10 bushels in 1930 drought years. In cultivation about 60 years. No amendments used on land.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2194	A_{1p}	0-7"	Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 2.5/2, moist) silty clay loam; weak fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
2195	A_3	7-10"	Very dark grayish brown (10YR 3/2, dry) to very dark brown (10YR 2/2, moist) silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear

SOIL SURVEY LABORATORY Lincoln, Nebr. September 1958

SOIL TYPE Bridgeport **LOCATION** Dundy County, Nebraska

SOIL NOS. [illegible]/Nebr-29-1 **LAB. NOS.** 6814-6820

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 1B1a									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-5	Ap	0.1	0.2a	0.2a	1.8a	43.8a	42.5	11.4	80.7	7.0	-	1
5-11	AC	0.1	0.1a	0.1a	1.3a	41.2a	45.3	11.9	79.5	8.1	-	1
11-23	C1	0.1	0.1a	0.1a	1.6a	47.2a	40.8	10.1	83.7	5.7	-	1
23-35	C2	-	-	0.1a	0.8a	35.1a	54.8	9.2	79.7	10.8	-	sil
35-47	A11b	-	0.1a	0.3a	2.5a	44.5a	39.8	12.8	80.0	6.4	-	1
47-56	A12b	-	0.1a	0.3a	2.6a	45.4a	38.3	13.3	79.5	6.4	-	1
56-66	A13b	-	0.2a	0.4a	3.1a	45.8a	37.1	13.4	79.3	6.1	-	1

	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	4A3a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:1	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC×10³ MILLIMHOS PER CM 8A1a	$CaCO_3$ equivalent %	Vol. Wt. g/cc	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
7.7	8.2	8.8	0.64	0.066	10	<0.20	0.8	3				7.1
7.7	8.2	8.8	0.37	0.044	8	<0.20	0.5	3	1.43			7.4
7.7	8.3	8.9	0.14	0.019		<0.20	0.5	5				6.2
7.7	8.2	8.8	0.19	0.025		<0.20	0.4	4	1.36			7.7
7.7	8.0	8.7	0.50	0.050	10	<0.20	0.4	2				7.4
7.8	8.1	8.8	0.41	0.043	10	<0.20	0.5	3				7.8
7.8	8.1	8.8	0.32	0.035	9	<0.20	0.4	3				7.8

5A1a	EXTRACTABLE CATIONS 5E1a					5E2	8A1 SATURATION EXTRACT SOLUBLE					8A
CATION EXCHANGE CAPACITY NH_4Ac	Ca	Mg	H	6P2a Na	6Q2a K	EXCH. Na %	6P1a Na	6Q1a K				MOISTURE AT SATURATION %
← milliequivalents per 100g. soil →							← milliequivalents per liter →					
14.4				-	2.2	-	0.3	1.8				43.1
14.8				-	1.4	-	0.2	0.7				40.9
12.8				-	1.0	-	0.3	0.5				40.5
15.3				0.1	1.2	1	0.3	0.4				43.2
15.0				0.1	1.0	1	0.4	0.4				44.6
14.2				0.1	1.2	1	0.4	0.5				45.5
13.7				0.1	1.3	1	0.5	0.6				45.7

a. Few $CaCO_3$ concr. Also few smooth black concr.

Soil type: Bridgeport very fine sandy loam
Soil No.: S57Nebr-29-1-(1-7)
Location: .25 mile north and .1 mile east of southwest corner Sec. 36, T2N, R37W, about 120 feet north of Highway 34 and 540 feet east of culvert; approximately 3 miles southwest of Max, Dundy County, Nebraska.
Topography: On a 2 percent smooth south facing colluvial-alluvial fan slope.
Land use: Alfalfa 1957. Described by: Ross Greenawalt.

Horizon and Lincoln Lab. Number	
Ap 6814	0 to 5 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak medium and coarse angular blocky structure (cloddy); soft, dry; very friable, moist; strong effervescence; gradual smooth lower boundary.
AC 6815	5 to 11 inches. Light brownish gray or pale brown (10YR 6/2.5 dry) to grayish brown (10YR 5/2 moist) very fine sandy loam; weak coarse angular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C1 6816	11 to 23 inches. Very pale brown or pale brown (10YR 6.5/3 dry) to brown (10YR 5/3 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
C2 6817	23 to 35 inches. Very pale brown (10YR 7/3 dry) to pale brown or brown (10YR 5.5/3 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
A11b 6818	35 to 47 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown or very dark grayish brown (10YR 3.5/2 moist) very fine sandy loam; weak fine and very fine granular structure; soft, dry; very friable, moist; noncalcareous; gradual smooth lower boundary.
A12b 6819	47 to 56 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak coarse subangular blocky structure breaking into weak very fine granules; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
A13b 6820	56 to 66 inches. Pale brown (10YR 6/3 dry) to grayish brown or brown (10YR 5/2.5 moist) very fine sandy loam; weak coarse subangular blocky structure breaking into weak very fine granules; soft, dry; very friable, moist; violent effervescence.

Remarks: The lime occurring in this profile is disseminated. Few krotovinas approximately 2 inches in diameter occur throughout the profile which have been caused by rodent working and mixing. There is some question if coarse angular and subangular blocky structure in the C horizons and the A1b horizons is genetic soil structure. The structure may be due to soil fracture rather than to true structure planes. Source of parent material is a 3- to 4-square mile drainage area consisting of steep thin silty soils with Tertiary outcrops on the lower slopes. (A side drainage to the Republican River Valley.) Horizons Ap, C1 and A11b were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. September 1958

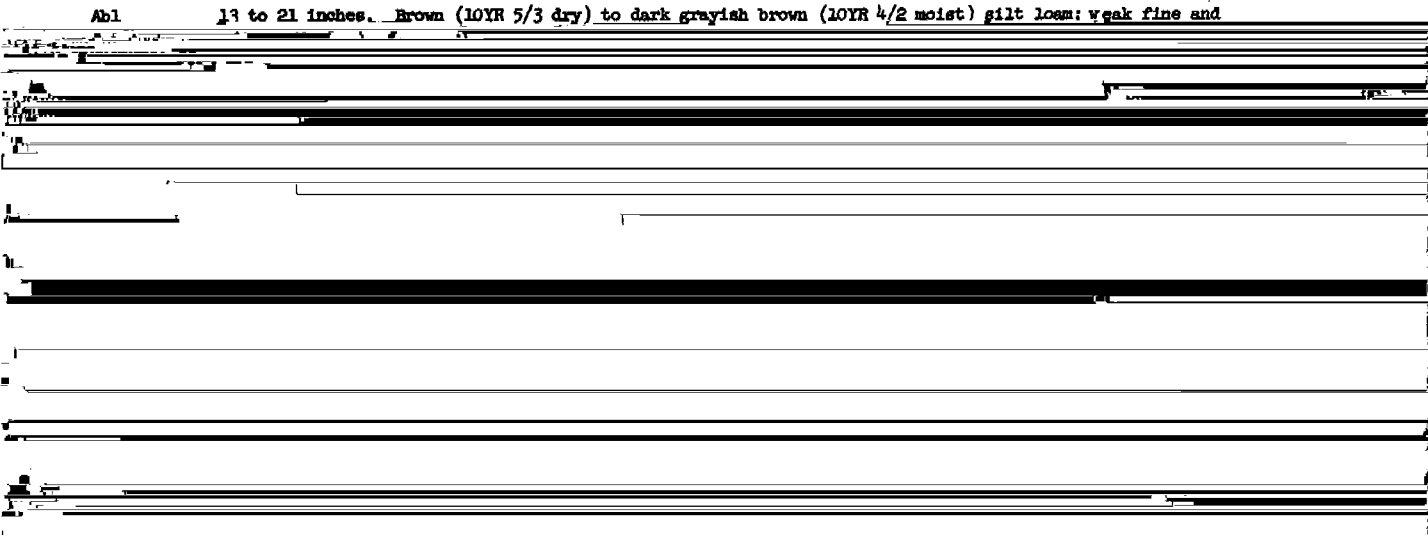
SOIL TYPE Bridgeport silt loam LOCATION Dundy County, Nebraska

SOIL NOS. S57Nebr-29-2 LAB. NOS. 6821-6827

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-5	Ap	0.1	0.2a	0.2a	1.3a	29.7a	53.1	15.4	70.3	13.5	-	sil
5-9	AC	0.1	0.1a	0.2a	1.2a	28.3a	52.3	17.8	67.8	13.8	-	sil
9-13	C1	-	-	0.1a	1.6a	37.9a	45.0	15.4	73.9	10.4	-	l
13-21	Ab1	-	-	0.2a	1.1a	36.9a	46.2	15.6	73.8	10.2	-	l
21-34	Cb1	0.1	-	0.2a	2.5a	36.2a	47.5	13.5	76.6	9.1	-	l
34-42	Ab2	-	0.2a	0.7a	2.3a	36.2a	48.0	12.6	76.9	8.8	-	l
42-60	Cb2	-	0.4a	2.3a	5.0a	46.6a	34.8	10.9	79.5	4.9	-	vfsl

Soil type: Bridgeport silt loam
Soil No.: S57Nebr-29-2-(1-7)
Location: 2300 feet east and 45 feet north of southwest corner Sec. 30, T2N, R36W; approximately 1½ miles southwest of Max, Dundy County, Nebraska, on U.S. Highway 34.
Topography: On a 1 percent convex south-southwest facing colluvial-alluvial fan slope.
Land use: Corn 1957. Described by: Ross Greenawalt.

Horizon and Lincoln Lab. Number	
Ap 6821	0 to 5 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak very fine granular structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
AC 6822	5 to 9 inches. Pale brown (10YR 6/3 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) silt loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C1 6823	9 to 13 inches. Brown or yellowish brown (10YR 5/3.5 dry) to dark brown or dark yellowish brown (10YR 4/3.5 moist) silt loam; weak coarse subangular blocky structure breaking into weak fine granules; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
Ab1	13 to 21 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak fine and



	lower boundary.
Cb1 6825	21 to 34 inches. Very pale brown or pale brown (10YR 6.5/3 dry) to grayish brown or brown (10YR 5/2.5 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
Ab2 6826	34 to 42 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown or very dark grayish brown (10YR 3.5/2 moist) very fine sandy loam; weak fine and very fine granular structure; soft, dry; very friable, moist; violent effervescence; clear smooth lower boundary.
Cb2 6827	42 to 60 inches. Pale brown (10YR 6/3 dry) to grayish brown (10YR 5/2 moist) light very fine sandy loam; weak coarse subangular structure; soft, dry; very friable, moist; violent effervescence.

Remarks: The lime occurring in this profile is disseminated. Few krotovinas approximately 2 inches in diameter occur throughout the profile which have been caused by rodent working and mixing. There is some question if the coarse subangular blocky structure in the AC, C1, Cb1, and Cb2 horizons is genetic soil structure. The structure may be due to soil fracture rather than true structure planes. Source of parent material is a 3- to 4-square mile drainage area consisting of steep and thin silty soils with Tertiary outcrops on the lower slopes. (A side drainage to the Republican River Valley.) Horizons Ap, Ab1, and Ab2 sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. September 1958

SOIL TYPE Bridgeport **LOCATION** Dundy County, Nebraska

SOIL NOS. S57Nebr-29-4 **LAB. NOS.** 6833-6837

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-7	Ap	0.2a	2.4b	4.8b	12.3b	33.2b	33.5	13.6	65.0	8.2	-	vfsl/l

Soil type: Bridgeport very fine sandy loam
Soil No.: S57Nebr-29-4-(1-5)
Location: 2555 feet west of northeast corner Sec. 33, T1N, R41W, approximately 85 feet east of north quarter corner, .75 mile west of Haigler, Dundy County, Nebraska, on curve of U.S. Highway 34, about .1 mile beyond highway intersection with Sullivan Draw, then west 175 feet.
Topography: On a smooth 0-1 percent northeast facing high bottom or low terrace position along the Arikaree and Republican Rivers.
Land use: Sorghum 1957. Described by: Ross Greenawalt.

Horizon and Lincoln Lab. Number	
Ap 6833	0 to 7 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak fine and very fine granular structure; soft, dry; very friable, moist; slight effervescence; abrupt smooth lower boundary.
AC 6834	7 to 19 inches. Pale brown (10YR 6/3 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) silt loam; weak coarse subangular blocky structure breaking into weak fine and medium granules; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C1 6835	19 to 34 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C2 6836	34 to 48 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) light very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C3 6837	48 to 60 inches. Pale brown (10YR 6/3 dry) to grayish brown (10YR 5/2 moist), very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence.

Remarks: The lime in this profile occurs as disseminated lime. Few krotovinas approximately 2 inches in diameter occur throughout the profile which have been caused by rodents. There is some question if the weak coarse subangular blocky structure in the C1, C2 and C3 horizons is genetic soil structure. The structure may be due to soil fracture rather than to true structure planes. This soil is developing in material that has been deposited by a rather large drainage (Sullivan Draw). The present channel of this drainage is slightly lower than the surrounding land where this soil is located. This position is also slightly higher than the first bottom lands of the Republican and Arikaree Valleys. The drainage area of Sullivan Draw consists of steep light-colored loessal soils with Tertiary outcrops on some slopes. Horizons Ap, C1 and C3 sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. February 1959

SOIL TYPE Burchard clay loam LOCATION Saunders County, Nebraska,

SOIL NOS. S58Nebr-78-1-(1-8) LAB. NOS. 8414-8421

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-6	A1p	2.1	4.4	6.4	14.3	10.4	36.7	25.7	41.3	12.8	2	cl

Soil type: Burchard clay loam
Soil No.: S58Nebr-78-1-(1-8)
Location: 1100 feet south and 30 feet west of northeast corner Sec. 30, T13N, R6E; approximately 3 miles east and 1/2 mile south of Valparaiso, Saunders County, Nebraska.
Physiography: Dissected till plain.
Relief: 40 to 60 feet.
Slope: 12 percent west facing slope.
Parent material: Glacial till.
Erosion: Moderate.
Drainage: Excessive.
Permeability: Moderately slow.
Land use: Alfalfa 1958. Described by: W. E. McKinzie and J. A. Elder.

Horizon and Lincoln Lab. Number	
Alp 8414	0 to 6 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) light clay loam; weak fine granular; friable moist; no effervescence; abrupt smooth boundary.
A12 8415	6 to 9 inches. Black (10YR 2/1 moist) to very dark grayish brown (10YR 3/2 dry) light clay loam; weak coarse subangular blocky to moderate medium granular; friable moist; no effervescence; abrupt smooth boundary.
B21 8416	9 to 13 inches. Dark brown (10YR 3/3 moist) to dark grayish brown (10YR 4/2 dry) clay loam; weak coarse prismatic to moderate fine and medium subangular blocks; slightly hard, dry; friable, moist; no effervescence; thin discontinuous clay skins on aggregates; clear smooth boundary.
B22 8417	13 to 20 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) heavy clay loam; weak coarse prismatic to strong fine and medium subangular blocks; hard, dry; firm, moist; no effervescence; thin continuous clay skins on aggregates; few small iron stains; abrupt smooth boundary.
B3ca 8418	20 to 24 inches. Dark brown (10YR 4/3 moist) to pale brown (10YR 6/3 dry) clay loam; weak coarse prismatic to moderate medium subangular blocky; hard, dry; firm, moist; violent effervescence; few pockets of disseminated lime; thin discontinuous clay skins on aggregates; clear smooth boundary.
C1 8419	24 to 36 inches. Dark grayish brown (2.5Y 4/2 moist) to grayish brown (2.5Y 5/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; violent effervescence; many fine distinct yellowish brown and dark brown mottles and small pockets and channels of soft white lime; gradual smooth boundary.
C2 8420	36 to 48 inches. Approximately 50 percent dark grayish brown (2.5Y 4/2 moist) to light grayish brown (2.5Y 6/2 dry) and 50 percent dark yellowish brown (10YR 4/4 moist) to yellowish brown (10YR 5/4 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, many pockets and channels of soft white lime; horizon streaked with reddish brown iron stains; gradual smooth boundary.
C3 8421	48 to 60 inches. Approximately 50 percent dark grayish brown (2.5Y 4/2 moist) to light grayish brown (2.5Y 6/2 dry) and 50 percent dark yellowish brown (10YR 4/4 moist) to yellowish brown (10YR 5/4 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; violent effervescence; mottled with many fine distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; horizon streaked with reddish brown iron stains.

Note: Medium and coarse gravels scattered throughout profile.

SOIL SURVEY LABORATORY Lincoln, Nebr. February 1959

SOIL TYPE [redacted] LOCATION [redacted]

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-6	A1p	1.4a	2.6a	3.0a	6.9a	6.3a	43.3	36.5	36.4	16.7	Tr.	cl
6-8	A12	0.9a	2.8a	3.2a	7.5a	6.2a	40.6	38.8	34.8	15.9	Tr.	cl
8-12	B21	1.6a	3.6a	3.7a	8.9a	7.0a	34.2	41.0	29.8	16.1	Tr.	c
12-19	B22	1.4a	4.0a	4.3a	9.6a	7.7a	33.8	39.2	30.4	16.1	Tr.	cl
19-26	B3ca	1.8a	4.5a	4.7a	10.4a	8.3a	35.9	34.4	31.3	18.3	2	cl

Soil type: Burchard clay loam
Soil No.: S58Nebr-78-5-(1-8)
Location: 160 feet north and 140 feet east of west quarter corner Sec. 20, T13N, R5E (approximately 40 feet north of small gully); 2½ miles west of Valparaiso, Saunders County, Nebraska.
Physiography: Dissected till plain.
Relief: 40 to 60 feet.
Slope: 12 percent west facing slope.
Parent material: Glacial till.
Erosion: Moderate.
Drainage: Excessive.
Permeability: Moderately slow.
Land use: Corn 1958. Described by: W. E. McKinzie and J. A. Elder.

Horizon and Lincoln Lab. Number	
A1p 8449	0 to 6 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) light clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
A12 8450	6 to 8 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) clay loam; weak coarse subangular blocky; friable, moist; no effervescence; lighter-colored material from B horizon present is result of rodents; abrupt smooth lower boundary.
B21 8451	8 to 12 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam; weak coarse prismatic to moderate fine subangular blocky; slightly hard, dry; firm, moist; no effervescence; thin continuous clay skins on aggregates; clear smooth boundary.
B22 8452	12 to 19 inches. Dark grayish brown (10YR 4/2 moist) to grayish brown (10YR 5/2 dry) heavy clay loam; weak coarse prismatic to strong fine and medium blocky; slightly hard, dry; firm, moist; no effervescence; thin continuous clay skins on aggregates; abrupt smooth boundary.
B3ca 8453	19 to 26 inches. Dark grayish brown (2.5Y 4/2.5 moist) to grayish brown (2.5Y 5/2 dry) heavy clay loam; weak coarse prismatic to moderate fine and medium blocky; hard, dry; firm, moist; violent effervescence; thin discontinuous clay skins on aggregates; few fine faint yellowish brown and dark brown mottles; small pockets of soft white lime; clear smooth boundary.
C1 8454	26 to 36 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; many medium distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; iron and manganese concretions present; gradual smooth boundary.
C2 8455	36 to 46 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; many medium distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; iron and manganese concretions present; gradual smooth boundary.
C3 8456	46 to 60 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; many medium distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; iron and manganese concretions present.

Note: Few small and medium gravels scattered throughout profile.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Canyon loam, eroded **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-8-(1-4) **LAB. NOS.** 5842-5845

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 mm	TEXTURAL CLASS
0-6	A1p	7.8a	15.1a	12.0a	14.1a	12.5a	21.3	17.2	34.6	6.8	5	sl
6-11	AC	8.6a	12.5a	9.4a	10.5a	10.0a	22.8	26.2	28.1	10.2	9	scl
11-18	C1	6.5a	11.0a	7.9a	9.7a	10.1a	25.9	28.9	28.3	13.2	8	scl
18-24	Dr	13.7b	10.0b	5.2b	7.2b	9.4b	29.2	25.3	28.2	14.5	32	l

	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1b Saturated Paste	8C1a 1:1	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC×10³ MILLIMHOS PER CM 8A1a	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
7.5	8.0	8.5	1.27	.130	9.8	<0.20	0.7	11				9.5
7.6	8.0	8.8	0.78	.096	8.1	<0.20	0.6	22				13.0
7.7	8.1	8.9	0.45	.051	8.8	<0.20	0.6	40				13.0
7.7	8.2	9.0	0.22	.030		<0.20	0.6	45				10.3

Soil type: Canyon loam, eroded
Location: Kimball County, Nebraska. 0.3 mile west of SE corner and 250 feet north (along oil well road) Sec. 3, T13N, R55W. About 8 miles south and 3 miles east of Kimball, Nebraska.
Topography: About a 4 percent ridge top in weathered Tertiary sands and silts on the dissected Tertiary plains.
Cultivation: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-8-(1-4)
Lincoln

Lab.No.	Horizon	
5842	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak fine granular; very friable, moist; strong effervescence; abrupt smooth lower boundary.
5843	AC	6-11 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; gradual smooth lower boundary.
5844	C1	11-18 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) loam; massive structure; very friable, moist; violent effervescence; abrupt wavy lower boundary.
5845	Dr	18-24 inches. Weathered Tertiary consisting of large amount of limestone fragments with a loamy sand to sandy loam (10YR 7/3 moist) matrix. This horizon appears to have been reworked by rodents as materials from C1 and AC horizons were mixed through it.

Note: Horizons A1 and C1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Canyon loam, eroded **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-9-(1-4) **LAB. NOS.** 5846-5849

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-4	A1p	7.8a	11.4a	9.7a	16.7a	19.1a	22.3	13.0	46.0	5.0	4	s1

Soil type: Canyon loam, eroded
Location: Kimball County, Nebraska. 300 feet east and 140 feet north of S1/4 corner Sec. 27, T13N, R56W. About 12 miles south and 3.5 miles west of Kimball, Nebraska.
Topography: About a 2 percent ridgetop in weathered reworked Tertiary sands and silts on the dissected Tertiary plains.
Cultivation: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-9-(1-4)

Lincoln Lab.No.	Horizon	
5846	Alp	0-4 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak fine granular; very friable, moist; strong effervescence; abrupt smooth lower boundary.
5847	AC	4-9 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; clear smooth lower boundary.
5848	C	9-16 inches. Light brownish gray (10YR 6/2 dry) to brown (10YR 5/3 moist) loam; massive structure; very friable, moist; violent effervescence; abrupt wavy lower boundary.
5849	Dr	16-22 inches. Pinkish gray (7.5YR 7/2 dry) to light brown (7.5YR 6/4 moist) partially weathered Tertiary consisting of large amount of limestone fragments with a sandy loam to loam matrix.

Note: 0-16 inches. Limestone fragments on the surface and throughout profile. Fragments consist of 5 to 10 percent of soil mass. In the "Dr" area a 4-inch rodent hole with a 12-inch cavity (nest) was found. Horizons Alp and C

OIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Cass fine sandy loam, deep LOCATION Saunders County, Nebraska

SOIL NOS. 853Nebr-78-4-(1-6) LAB. NO. 1498-1503

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 <19mm	
0-6	A1p	0.4	2.8	7.8	25.4	22.0	30.6	11.0	58.3	9.3	Tr.	fsl
6-15	A12	0.2	2.6	8.9	29.0	21.7	27.4	10.2	59.9	6.4	-	fsl

Soil type: Cass fine sandy loam, deep
Soil No.: S53Nebr-78-4-(1-6)
Location: Five hundred feet north and 100 feet west of the SE corner Sec. 25, T14N, R9E, Saunders County, Nebraska.
Topographic position: High bottom land not subject to flood.
Relief: Slight; smooth very gently undulating swells and swales; slope less than 1 percent.
Drainage: Well drained.
Ground water: Probably 7 to 10 feet below surface.
Root distribution: Normal.
Land use: Cultivated. Corn 1953.
Described by: B. H. Williams and Donald C. Yost.

Mandan Lab.No.	Horizon	
1498	Alp	0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) fine sandy loam; moderate fine and very fine granular; slightly hard, dry; very friable, moist; noncalcareous, some partly decayed crop residues mixed throughout; abrupt smooth lower boundary.
1499	A12	6-15 inches. Dark gray (10YR 4/1 dry) to nearly black (10YR 2.5/1 moist) loam; weak medium and coarse subangular blocky separating to moderate fine crumb and moderate very fine granular;

slightly hard, dry; very friable, moist; larger aggregates contain many fine and very fine pores and root openings, noncalcareous; gradual smooth lower boundary.

1500	AC	15-22 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) fine sandy loam; very weak coarse and very coarse subangular blocky breaking to moderate fine and very fine granular; slightly hard, dry;very friable, moist; larger aggregates have many fine and medium size pores and root openings; noncalcareous; gradual smooth lower boundary.
1501	C1	22-29 inches.. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3.5/2 moist) fine sandy loam; weak fine and very fine granular; slightly hard, dry; very friable, moist; many medium and large pores; noncalcareous; some mixing of lighter colored materials from below by worms; gradual smooth lower boundary.
1502	C2	29-36 inches. Light brownish gray (10YR 6/2.5 dry) to grayish brown (10YR 5/2 moist) loamy fine sand; appears massive in place when moist but breaks into very weak medium and fine subangular blocks when dry; slightly hard, dry; very friable, moist; noncalcareous; gradual smooth lower boundary.
1503	C3	36-49 inches. Light brownish gray (10YR 6/2 dry) to grayish brown (10YR 5.5/2 moist) loamy very fine sand; massive, breaking into rounded lumps which when dry crush easily to single grains; slightly hard, dry; very friable, moist; noncalcareous; abrupt lower boundary.
	D	49-60 inches. Not sampled, medium to coarse sand.

SCS-421
10-64

U. S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Crete silt loam SOIL Nos S60Nebr-18-1 LOCATION Clay County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 14263-14270 December 1964

Depth (In)	Horizon	1B1a Total Sand (2–0 05)	Total Silt (0.05–0.002)	Total Clay (< 0 002)	Sand Very coarse (2–1)	Sand Coarse (1–0.5)	Sand Medium (0 5–0 25)	Sand Fine (0.25–0.1)	Sand Very fine (0 1–0 05)	Silt (0 05–0 02)	Silt Int III (0 02–0 002)	Silt Int II (0 2–0.02)	Sand (2–0.1)			Coarse fragments 2A2 > 2 Pct.	Coarse fragments 2 – 19 Pct. of < 76mm	Coarse fragments 19 – 76 Pct. of < 76mm
		Pct of < 2 mm																
0-7	Ap	7.6	69.9	22.5	-	0.1	0.1	0.4	7.0	48.2	21.7	55.4	0.6			-	-	
7-11	A3	6.1	61.5	32.4	-	-	0.1	0.3	5.7	39.7	21.8	45.5	0.4			-	-	
11-15	B21	4.1	46.7	49.2	-	-	-	-	4.1	29.7	17.0	33.8	-			-	-	
15-24	B22	5.0	52.4	42.6	-	-	0.1	0.2	4.7	32.2	20.2	37.0	0.3			-	-	
24-28	B3	6.5	58.3	35.2	-	-	0.1	0.2	6.2	37.3	21.0	43.6	0.3			-	-	
28-38	C1ca	7.9	64.9	27.2	0.2a	0.2a	0.3a	0.6a	6.6b	38.0	26.9	44.9	1.3			tr.	tr.	
38-48	C2ca	9.8	70.1	20.8	0.6a	0.3a	0.2b	0.7b	7.3b	41.3	28.8	48.9	1.8			tr.	tr.	
48-60	C3ca	7.0	73.3	19.7	0.2a	0.2a	0.2b	0.6b	5.8b	40.9	32.4	47.0	1.2			tr.	tr.	

Depth (In.)	6A1a Organic carbon C Pct.	6B1a Nitrogen Pct	C/N		6E1c Carbonate as $CaCO_3$ Pct	6C1a Ext. Iron as Fe Pct.	Bulk density 4A1a Field-State g/cc	Bulk density 4A1c 30-Cm. g/cc	Bulk density 4A1h Oven-Dry g/cc	4H1 Extensibility in per horizon	Water content 4B4 Field-State Pct	Water content 4B3 30-Cm. Pct.	Water content 4B1b 1/3 Bar Pieces Pct	Water content 4B2 15-Bar Pct.	Water content 4C1 1/3-to 15-Bar in per horizon		pH 8C1a (1:1)
0-7	1.48	0.120	12			0.4	1.46	1.35	1.51d	.27	12.8	29.5	19.4	10.2	0.8		6.1
7-11	1.13	0.104	11			0.6	1.48	1.32	1.50d	.17	8.1	28.3	22.6	14.9	0.4		6.1
11-15	0.88	0.084	10			0.7	1.84d	1.22d	1.84d	.52		35.6	32.0	24.0	0.4		6.4
15-24	0.57	0.059	10			0.6	1.72	1.34	1.84d	.90	11.5	30.0	27.8	21.9	0.7		7.1
24-28	0.33				tr.	0.6	1.62	1.35	1.62d	.24	6.9	30.6	29.6	18.0	0.6		7.6
28-38	0.20				1	0.6	1.58	1.28	1.58d	.68	8.2	33.4	27.3	15.0	1.6		7.9
38-48	0.13				2	0.6	1.44	1.34	1.43d	.20	9.9	31.6	27.8	13.4	1.9		8.1
48-60	0.10				tr.	0.6	1.35	1.28	1.42d	.42	14.8	34.8	27.2	13.1	2.2		8.1

Depth (In)	Extractable bases 6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	5B1a Sum	6H1a Ext. Acidity	Cat. Exch. Cap. 5A3a Sum Cations	Cat. Exch. Cap. 5A1a NH_4OAc		8D3 Ca/Mg	Base saturation 5C3 Sum Cations Pct.	Base saturation 5C1 NH_4OAc CEC Pct.
	meq/100 g											
0-7	11.0	3.2	0.1	1.4	15.7	4.8	20.5	16.1		3.4	76	98
7-11	13.5	5.2	0.2	1.2	20.1	5.3	25.4	20.4		2.6	79	98
11-15	20.1	9.3	0.4	1.9	31.7	5.1	36.8	30.4		2.2	86	104
15-24	19.6	9.3	0.6	2.2	31.7	2.3	34.0	29.3		2.1	93	108
24-28			0.7	2.3				27.6				
28-38			0.7	2.3				24.2				
38-48			1.1	2.3				22.5				
48-60			1.3	2.3				22.9				

Depth (In.)	Ratios to Clay 8D1 NH_4OAc CEC	Ext. Iron	15-Bar Water		
0-7	.72	.018	.45		
7-11	.63	.018	.46		
11-15	.62	.014	.49		
15-24	.69	.014	.51		
24-28	.78	.017	.51		
28-38	.89	.022	.55		
38-48	1.08	.029	.64		
48-60	1.16	.030	.66		

a. > 50% Carbonate nodules.
b. 5-25% Carbonate nodules.
c. 9.9 Kg/m^2 to 60 inches.
d. One clod

NEBR-SCS HYATTSVILLE MD 1964

Soil type: Crete silt loam
Soil No.: S60Nebr-18-1
Classification: Maximal Chernozem.
Location: 0.6 mile west and 135 feet south of the northeast corner Sec. 2, T5N, R8W, Clay County, Nebraska.

Crop: Sorghum 1958-1960, corn 1957.
Parent material: Peorian loess.
Climate: Subhumid.
Physiography: Nearly level loess upland.
Relief: Subnormal.
Slope: 1 percent.
Aspect: Essentially level with 1 percent slope toward the east.
Erosion: Slight.
Permeability: Moderately slow.
Drainage: Moderately well drained.
Ground water: Deep.
Moisture: Near field capacity.
Root distribution: A few roots extended through to the C horizon.
Described by: Joseph M. Downs.

LSL No.	Horizon	
14263	Ap	0 to 7 inches. Very dark brown (10YR 2/2 moist uncrushed) (10YR 5/2 dry) silt loam, weak fine granular structure, friable, no effervescence; abrupt smooth lower boundary.
14264	A3	7 to 11 inches. Very dark grayish brown (10YR 3/2 moist uncrushed) (10YR 6/2 dry) silty clay loam, weak fine subangular blocky structure, friable, no effervescence; abrupt smooth lower boundary.
14265	B21	11 to 15 inches. Dark brown (10YR 3/3 moist uncrushed) (10YR 4/3 moist crushed) (10YR 6/3 dry) silty clay, moderate fine subangular blocky structure, few thin continuous clay films, firm, no effer-

the B3; clear smooth lower boundary.

14266	B22	15 to 24 inches. Dark grayish brown (2.5Y 4/2 moist uncrushed) (10YR 6/3 dry) silty clay, moderate medium angular and subangular blocky breaking to fine subangular blocky, common thin continuous clay films, firm, no effervescence; clear smooth lower boundary.
14267	B3	24 to 28 inches. Dark grayish brown (10YR 4/2 moist uncrushed) (10YR 7/3 dry) heavy silty clay loam, weak coarse subangular blocky structure, few discontinuous clay films, friable, no effervescence; clear smooth lower boundary.
14268	C1ca	28 to 38 inches. Yellowish brown (10YR 5/4 moist uncrushed) (10YR 7/2 dry) heavy silt loam, massive,

SOIL SURVEY LABORATORY

SOIL NOS. S55Neb-30-1-(1-8) LAB. NOS. 3372-3379

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 a 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	0.1	-	-	0.2	5.5	69.0	25.2	53.8	20.8	-	sil
6-8	A12	0.1	-	-	-	4.5	64.5	30.9	48.0	21.0	-	sicl
8-10	A3	-	-	-	-	3.7	60.3	36.0	43.2	20.8	-	sicl
10-19	B21	-	-	-	-	3.2	49.5	47.3	33.6	19.1	-	sic
19-27	B22	-	-	-	-	2.8	57.1	40.1	36.0	23.9	-	sic
27-39	B3ca	0.2	0.3	0.1	0.3	3.5	65.4	30.2	41.3	27.8	-	sicl
39-49	Cca	0.1	0.1	0.1	0.3	4.1	68.6	26.7	44.8	28.1	-	sil
49-60	C	0.1	0.2	0.2	0.5	3.4	72.0	23.6	45.8	29.9	-	sil

	pH 8C1a		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM @25°C.	6E1a		MOISTURE TENSIONS		
			6A1a	6B1a		EST% SALT (BUREAU CUP)						4B2
	1:5	1:10	ORGANIC CARBON	NITROGEN	C/N			$CaCO_3$ equivalent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:1			%	%				%		%	%	%
5.6	6.2	6.3	2.02	.158	12.8							10.9
5.4	6.1	6.1	1.66	.140	11.8							13.2
5.7	6.1	6.3	1.40	.124	11.3							15.0

Soil type: Crete silt loam
Soil No.: S55Nebr-30-1-(1-8)
Location: 1250 feet east and 120 feet north of southwest corner Sec. 2, T6N, R2W, Fillmore County, Nebraska; 1 mile south and 4½ miles east of center of Geneva, Nebraska.
Physiography: Gentle eastward slope of about 1 percent gradient, in broadly undulating loess-mantled plain.
Use: Cultivated, corn.
Collected by: B. H. Williams, J. A. Elder, T. E. Beesely, R. D. Greenawalt, and R. H. Jordan, November 1955.
Described by: B. H. Williams.

Horizon and Mandan Lab. Number

Alp — 0 to 6 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; medium fine and very

[redacted]

A12 3373 — 6 to 8 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; weak coarse blocky structure separating to moderate fine granules; soft, dry; friable, moist; clear lower boundary.

A3 3374 — 8 to 10 inches. Dark gray to very dark grayish brown or very dark brown with light sprinkling of leached gray silt on peds (10YR 4.5/1 dry to 2.5/2 moist) silty clay loam; strong medium and fine granular and very fine subangular blocky structure; the lower one inch has some of the characteristics of a degrading B1; the peds fall apart quite readily when dry or only slightly moist; hard, dry; firm, moist; abrupt lower boundary.

B21 3375 — 10 to 19 inches. Dark brown to very dark brown or dark brown (10YR 3.5/3 dry to 2.5/3 moist) with 2/2 coating on vertical faces of peds, silty clay; moderate coarse prismatic and strong medium and fine blocky structure; very hard, dry; very firm, moist; noncalcareous; gradual lower boundary.

B22 3376 — 19 to 27 inches. Pale brown to brown (10YR 6/3 dry to 5/3 moist) with 5/2, dry, and 4/2, moist, coatings on vertical faces of peds, silty clay; weak to moderate coarse prismatic and strong medium and coarse blocky structure; very hard, dry; very firm, moist; a few very fine dark brown soft iron-manganese specks; fine roots common in this horizon and in the ones above; noncalcareous; clear lower boundary.

B3ca 3377 — 27 to 39 inches. Pale yellow to light yellowish brown (2.5Y 7/3 dry to 6/3 moist) silty clay loam; a few faint fine yellow and brown mottles and very fine dark brown iron-manganese soft concretions; weak coarse and medium blocky structure with some stronger faces on the peds along the more pronounced vertical planes; hard, dry; slightly firm, moist; slightly calcareous throughout; soft and hard lime concretions and soft thread lime and very thin lime coating on some of the peds; a few roots and many root channels and pores; gradual lower boundary.

Cca 3378 — 39 to 49 inches. Pale yellow (2.5Y 8/3 dry to 7/3 moist) silt loam; common faint fine pale yellow to strong brown mottles; massive except an occasional widely-spaced crack along which some subangular coarse blocks have formed; slightly hard, dry; friable, moist; calcareous except in spots; lime mainly in fine specks, threads, and soft concretions; a few fine roots and many root channels and pores in this horizon and the one below; gradual lower boundary.

C 3379 — 49 to 60 inches. White to pale yellow (2.5Y 8/2 dry to 7/3 moist) silt loam; common faint to prominent yellowish brown, brown, and strong brown mottles and streaks of iron staining; massive; soft, dry; friable, moist; generally noncalcareous except on scattering of lime concretions that are 1/8- to 1/4-inch in diameter.

OIL SURVEY LABORATORY Lincoln, Nebr. 8/1/57

SOIL TYPE Crete silt loam **LOCATION** Fillmore County, Nebraska

SOIL NOS. S55Neb-30-2-(1-8) **LAB. NOS.** 3380-3387

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 a									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-5	A1p	-	0.1	0.1	0.3	5.0	69.5	25.0	53.9	20.8	-	sil
5-8	A12	-	0.1	-	0.1	3.6	64.0	32.2	44.7	23.1	-	sicl
8-10	A3	-	0.1	-	-	2.6	57.5	39.8	37.1	23.0	-	sicl
10-21	B21	0.1	0.1	-	0.1	2.0	47.7	50.0	27.9	21.9	-	sic
21-25	B22	-	0.1	0.1	0.2	2.0	54.5	43.1	29.4	27.2	-	sic
25-37	B3ca	0.6	0.4	0.2	0.3	3.1	62.2	33.2	37.3	28.2	-	sicl
37-48	Cca	0.2	0.4	0.2	0.3	3.6	69.7	25.6	43.2	30.3	-	sil
48-60	C	0.4	0.2	0.1	0.3	4.0	71.3	23.7	45.4	30.1	-	sil

	pH 8C1a		ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM @25-C.	6E1a		MOISTURE TENSIONS		
			6A1a ORGANIC CARBON	6B1a NITROGEN				$CaCO_3$ equivalent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.
1:1	1:5	1:10	%	%	C/N			%		%	%	%
5.6	5.9	6.0	1.96	.160	12.2							10.6
5.6	6.0	6.0	1.79	.154	11.6							14.0
5.8	6.2	6.4	1.47	.129	11.4							17.0
6.8	7.3	7.5	1.13	.091	12.4							22.1
7.6	8.3	8.5	0.63	.065	9.7			2				20.1
7.6	8.0	8.3	0.33					4				16.8
7.5	8.0	8.1	0.16					2				15.0
7.9	8.6	8.9	0.12					3				14.4

5A1a CATION	EXTRACTABLE CATIONS 5B1a 6N2b	6O2b	6P2a	6Q2a	BASE SAT. %					MOISTURE

Soil type: Crete silt loam
Soil No.: S55Nebr-30-2-(1-8)
Location: 1450 feet north and 200 feet west of southeast corner Sec. 33, T6N, R1W, Fillmore County, Nebraska; one mile east and 1-3/4 miles south of Exeter, Nebraska.
Physiography: Gently undulating loess-mantled plain on eastward slope of less than one percent gradient. Surface drainage is into shallow small and large depressions and into shallowly entrenched drains.
Use: Cultivated, corn.
Collected by: B. H. Williams, J. A. Elder, T. E. Beesley, R. D. Greenawalt and R. H. Jordan, November 1955.
Described by: B. H. Williams.

Horizon and Mandan Lab. Number	
A1p 3380	0 to 5 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; medium fine and very fine granular structure; soft, dry; friable, moist; noncalcareous; abrupt lower boundary.
A12 3381	5 to 8 inches. Dark gray to black or very dark brown (10YR 4/1 dry to 2/1.5 moist) silt loam; weak coarse blocky separating easily to fine granular structure; slightly hard, dry; friable, moist; noncalcareous; clear lower boundary.
A3 3382	8 to 10 inches. Dark gray or gray to very dark brown (10YR 4.5/1 dry to 2/2 moist) silty clay loam; strong fine granular and very fine subangular blocky structure; aggregates fall apart easily when dry and moist; the individual peds are hard when dry and firm when moist and thinly coated with leached gray silt grains that are apparent only when the soil is dry; noncalcareous; clear lower boundary.
B21 3383	10 to 21 inches. Very dark grayish brown to very dark brown or dark brown (10YR 3/2 dry to 2/2.5 moist) silty clay; moderate coarse prismatic and strong fine and medium blocky structure; very hard, dry; very firm, moist; a very few very fine strong brown and dark brown iron-manganese soft concretions; noncalcareous; gradual lower boundary.
B22 3384	21 to 25 inches. Light brownish gray to dark grayish brown (2.5Y 6/2 dry to 4/2 moist) silty clay; moderate coarse prismatic and strong fine and medium blocky structure; very hard, dry; very firm, moist; a few very fine iron-manganese soft concretions which are most evident on cut faces of peds; slightly calcareous in the lower 2 or 3 inches including a few fragments of brown-stained lime concretions; plant roots common in this and in the horizons above; clear lower boundary.
B3ca 3385	25 to 37 inches. Light gray to light olive gray (5Y 7/2 dry to 6/2 moist) heavy silty clay loam; a few faint to prominent fine brown and strong brown mottles and dark brown soft iron-manganese spots and soft concretions; moderate medium and coarse blocky structure; a few well-defined vertical cracks that form prisms 10 or more inches in diameter; slightly darker coating on prism faces than on remainder of ped faces; hard, dry; firm, moist; calcareous, with weak effervescence throughout; many soft and hard lime concretions that effervesce violently with dilute HCl; a few very fine plant roots and root channels; gradual lower boundary.
Cca 3386	37 to 48 inches. Pale yellow to light yellowish brown (2.5Y 7/3 dry to 6/3 moist) silty clay loam; common fine and coarse yellowish brown, strong brown, and dark brown mottles and a few rounded tubular soft to slightly hard iron concretions; massive but separates along vertical planes into very coarse prisms; slightly hard, dry; friable, moist; calcareous, including a few hard and soft lime concretions and much thread lime; strong effervescence; root channels common but no roots seen in this horizon and the one below; gradual lower boundary.
C 3387	48 to 60 inches. Pale yellow to light yellowish brown (2.5Y 7/3 dry to 6/3 moist) silt loam; common fine to coarse yellowish brown and strong brown mottles and dark brown soft iron segregations; massive; soft, dry; friable, moist; calcareous including a few threads, seams and spots of segregated lime; weak effervescence between lime spots.

SOIL SURVEY LABORATORY Lincoln, Nebr. 8/1/57

SOIL TYPE Crete silt loam **LOCATION** Saline County, Nebraska

SOIL NOS. S55Neb-76-1-(1-9) **LAB. NOS.** 3354-3362

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	-	0.1	0.1	0.3	3.6	71.3	24.6	51.0	24.1	-	sil
6-10	A12	-	0.1	0.1	0.2	3.4	68.2	28.0	47.4	24.3	-	sicl
10-13	AB	-	0.1	0.1	0.1	2.5	61.4	35.8	39.4	24.6	-	sicl
13-19	B21	-	-	-	0.1	2.1	48.9	48.9	30.8	20.3	-	sic
19-26	B22	-	-	-	-	2.5	52.3	45.2	31.5	23.3	-	sic
26-32	B23	-	-	-	0.1	2.6	55.9	41.4	34.2	24.4	-	sic
32-42	B3ca	0.7	0.2	0.1	0.2	2.6	60.6	35.6	35.7	27.6	-	sicl
42-52	C1ca	0.1	0.1	0.1	0.3	2.7	64.3	32.4	40.4	26.8	-	sicl
52-60	C2	-	0.1	0.1	0.4	2.3	63.7	33.4	39.1	27.1	-	sicl

	pH 8C1a		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC×10³ MILLIMHOS PER CM 25°C.	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
1:1												
5.6	5.8	6.0	1.77	.142	12.5							10.0
5.6	5.9	6.1	1.65	.138	12.0							11.6
5.8	6.2	6.3	1.36	.122	11.1							15.1
6.2	6.5	6.7	0.94	.088	10.7							20.4
6.7	7.0	7.2	0.58	.059	9.8							19.4
7.2	7.6	7.7	0.43									18.9
7.5	8.1	8.2	0.24					1				16.6
7.4	7.8	7.9	0.16					1				15.6
7.2	7.8	7.8	0.14					1				15.8

5A1a	EXTRACTABLE CATIONS			5B1a		BASE SAT. %						
CATION EXCHANGE CAPACITY NH_4Ac	6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K	5C1						MOISTURE AT SATURATION %
← milliequivalents per 100g. soil →												
19.1	11.8	3.4		0.1	1.0	85						
20.7	12.6	4.0		0.1	0.8	84						
23.6	14.2	5.3		0.2	0.8	87						
32.1	19.2	8.1		0.4	1.1	90						
32.5	20.4	8.5		0.5	1.1	94						
30.6	21.4	8.6		0.6	1.1	100						
28.5		8.7		0.7	1.1							
27.7		7.6		0.8	1.1							
28.0		8.9		0.9	1.1							

Soil type: Crete silt loam
Soil No.: S55Nebr-76-1-(1-9)

[redacted]

west of Wilber, Nebraska, across road from west entrance to cemetery.
Physiography: Nearly level loess plain; less than 1 percent slope to the south but enough slope to give adequate surface drainage.
Use: Cultivated, corn.
Collected by: B. H. Williams, J. A. Elder, T. E. Beesley, R. D. Greenawalt and R. H. Jordan, November 1955.
Described by: B. H. Williams.

Horizon and Mandan Lab. Number

Alp 3354 — 0 to 6 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; weak very fine granular; soft, dry; very friable, moist; noncalcareous; abrupt lower boundary.

A12 3355 — 6 to 10 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) heavy silt loam or silty clay loam; breaks out in medium and coarse blocks but separates into weak thick plates (tillage compaction) and moderate fine granules; hard, dry; friable, moist; noncalcareous; clear lower boundary.

AB 3356 — 10 to 13 inches. Very dark gray to very dark brown with faint gray sprinkling of leached silt on surface of dry peds (10YR 3/1.5 dry to 2/2.5 moist) silty clay loam; moderate fine granular in upper part grading to strong very fine subangular blocky structure in the lower part; hard, dry; friable, moist; noncalcareous; abrupt lower boundary.

B21 3357 — 13 to 19 inches. Grayish brown or dark grayish brown to dark brown (10YR 4.5/2.5 dry to 3/3 moist) silty clay; moderate coarse prisms and strong coarse blocks separating with moderate pressure into strong fine blocks; very hard, dry; very firm, moist; many very fine dark brown iron-manganese soft concretions; noncalcareous; gradual lower boundary.

B22 3358 — 19 to 26 inches. Brown to dark brown (10YR 5/3 dry to 3/3 moist) silty clay; moderate coarse prisms and blocks separating to strong fine blocks; very hard, dry; very firm, moist; many fine dark brown iron-manganese soft concretions; noncalcareous; gradual lower boundary.

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3359 — moderate to strong coarse blocky structure; very hard, dry; very firm, moist; iron-manganese concretions as noted in horizons above; noncalcareous; living and dead plant roots common in this horizon and horizons above; clear wavy lower boundary.

B3ca 3360 — 32 to 42 inches. Pale yellow to light olive brown (2.5Y 7/3 dry to 5/4 moist) silty clay loam; moderate medium and fine blocky structure with better-defined vertical than horizontal faces; a few very fine dark brown iron-manganese soft concretions throughout the horizon; hard, dry; friable, moist; calcareous, with many white soft and hard lime concretions; only weak effervescence between lime spots; only a few plant roots present; old root channels and pores common; clear wavy lower boundary.

C1ca 3361 — 42 to 52 inches. Pale yellow to light olive brown (2.5Y 7/3 dry to 5/4 moist) heavy silt loam or silty clay loam; a few faint fine gray and yellowish brown mottles and very fine dark brown iron-manganese soft concretions; mostly massive but an occasional vertical cracking plane shows slight dark-

SOIL SURVEY LABORATORY Lincoln, Nebr. 8/1/57

SOIL TYPE Crete silt loam LOCATION Saline County, Nebraska

SOIL NOS. S55Neb-76-2-(1-9) LAB. NOS. 3363-3371

Soil type: Crete silt loam
Soil No.: 855Nebr-76-2-(1-9)
Location: 1250 feet south and 100 feet west of northeast corner Sec. 29, T7N, R4E, Saline County, Nebraska.
Physiography: About 1 percent north slope in broad, undulating loess-mantled plain.
Use: Cultivated, grain sorghum.
Collected by: B. H. Williams, J. A. Elder, T. E. Beesley, R. D. Greenawalt, and R. H. Jordan, November 1955.
Described by: B. H. Williams.

Horizon and Mandan Lab. Number	
Alp 3363	0 to 5 inches. Dark gray to very dark brown (10YR 4.5/1.5 dry to 2/2 moist) silt loam; moderate fine and very fine granular structure; soft, dry; friable, moist; noncalcareous; abrupt lower boundary.
A12 3364	5 to 8 inches. Dark gray or dark grayish brown to very dark brown (10YR 4/1.5 dry to 2/2 moist) heavy silt loam; moderate fine granular structure; slightly hard, dry; friable, moist; noncalcareous; clear lower boundary.
AB 3365	8 to 11 inches. Very dark grayish brown to very dark brown with gray sprinkling of leached silt on surface of dry peds (10YR 3/2 dry to 2/2.5 moist) silty clay loam; strong fine granular and very fine subangular blocky structure; hard, dry; friable, moist; noncalcareous; clear to abrupt lower boundary.
B21 3366	11 to 21 inches. Dark grayish brown to dark brown (10YR 4/2.5 dry to 3/3 moist) silty clay; moderate coarse prismatic and strong fine blocky structure in upper part and strong medium blocky structure in lower part; very hard, dry; very firm, moist; a few very fine dark brown and strong brown iron-manganese soft concretions; noncalcareous; many plant roots in this horizon and the horizons above; gradual lower boundary.
B22 3367	21 to 31 inches. Grayish brown or brown to dark grayish brown or dark brown (10YR 5/2.5 dry to 3.5/2.5 moist) silty clay; moderate coarse prismatic and strong medium and coarse blocky structure; very hard, dry; very firm, moist; a few very fine dark brown iron-manganese soft concretions; noncalcareous; plant roots common; gradual lower boundary.
B23 3368	31 to 42 inches. Pale brown to brown (10YR 6/3 dry to 5/3 moist) heavy silty clay loam; weak coarse prismatic and moderate coarse blocky structure; very hard, dry; firm, moist; a few very fine dark brown iron-manganese soft concretions; noncalcareous; plant roots few and old root channels common; clear wavy lower boundary.
B3ca 3369	42 to 53 inches. Pale yellow to light olive brown (2.5Y 7/4 dry to 5/4 moist) silty clay loam; a few faint fine gray mottles and a few very fine dark brown iron-manganese soft concretions; moderate medium coarse blocky structure with strongly-defined faces on blocks along some of the vertical cracking planes; hard, dry; firm, moist; soft and hard lime concretions common but the soil mass is generally noncalcareous; a few fine roots and many old root channels and pores; gradual wavy lower boundary.
Cca 3370	53 to 57 inches. Pale yellow to light yellowish brown or light olive brown (2.5Y 7/4 dry to 5.5/4 moist) heavy silt loam or silty clay loam; massive except for a few widely-spaced vertical cracks; hard, dry; friable, moist; a few faint fine gray mottles and very fine dark brown iron-manganese soft concretions; calcareous; effervesces mainly on spots, streaks, and soft and hard lime segregations; few or no living roots but old root channels common; gradual lower boundary.
C 3371	57 to 62 inches. Pale yellow to light yellowish brown (2.5Y 7/4 dry to 6/4 moist) heavy silt loam; massive except an occasional widely-spaced vertical crack; a few faint fine gray and yellowish brown mottles; hard, dry; friable, moist; noncalcareous except an occasional fine speck that will effervesce with dilue HCL; no roots observed, but old root channels and tube-like pores are common.

Horizons Alp, B21, B22 and B3ca were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. December 1959

OIL TYPE Crofton silty clay loam, eroded **LOCATION** Dixon County, Nebraska

SOIL NOS. 859Nebr-26-3-(1-6) **LAB. NOS.** 11386-11391

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-6	Ap	0.1a	0.2a	0.2a	0.9a	8.0a	66.2	24.4	55.0	19.8	Tr.	sil
6-12	AC	0.1a	0.1a	0.1a	0.7a	8.7a	66.3	24.0	56.6	18.9	Tr.	sil
12-20	C1	<0.1	0.1b	0.1b	0.7b	8.2b	68.0	22.9	56.6	20.1	Tr.	sil
20-36	C2	0.1b	0.1b	0.1b	0.9b	9.5b	68.0	21.3	60.8	17.3	Tr.	sil
36-48	C3	0.1b	0.1b	0.1b	0.6b	13.7b	65.4	20.0	62.1	17.4	Tr.	sil
48-60	C4	0.1b	<0.1	<0.1	0.6b	12.1b	66.8	20.4	62.3	17.0	Tr.	sil

8C1a pH 1:1	pH 1:5	pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	Free Iron Fe_2O_3% 6C1a	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM @25°C.	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
8.0			1.12	0.115	9.7	1.2		8				11.0
8.0			0.34	0.045	8	1.3		9				10.4
8.0			0.23	0.035		1.3		9				10.6
8.1			0.16	0.027		1.2		9				10.0
8.2			0.13			1.2		8				9.7
8.2			0.12			1.3		8				9.4

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a Ca	6G2b Mg	6H1a H	6P2a Na	6Q2a K	BASE SAT. NH_4Ac EXCH.	Base Sat. % on Sum Cations	Sum Ext. Bases	Sum Ext. Cations	Ca_1/Mg	MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →										
18.6		2.8	<0.1	<0.1	0.8						
17.2		3.2	<0.1	<0.1	0.5						
17.6		4.3	<0.1	0.1	0.4						
16.8		5.0	<0.1	0.1	0.4						
16.8		6.3	<0.1	0.1	0.4						
16.8		7.4	<0.1	0.1	0.4						

a. Few carbonate concr. ($CaCO_3$?)
b. Few (Fe-Mn?) concr. Few carbonate concr. ($CaCO_3$?)

Soil type: Crofton silty clay loam, eroded
Soil No.: S59Nebr-26-3-(1-6)
Location: 750 feet south and 600 feet east of northwest corner Sec. 22, T28N, R4E, Dixon County, Nebraska. Northeast Nebraska Experiment Station.
Physiography: Rolling loess hills.
Relief: 50 to 100 feet.
Slope: 10 percent south, convex.
Parent material: Peorian loess.
Drainage: Well.
Permeability: Moderate.
Land use: Cultivated.
Described by and date: J. V. Drew and J. A. Elder, June 26, 1959.

Lincoln Lab. No.	Horizon	Depth	
11386	A_p	0-6"	Very dark grayish brown (10YR 3/2 moist) silty clay loam. Weak fine and very fine granular structure. Friable moist, hard dry. Violent effervescence, scattered hard lime concretions. Abrupt smooth boundary.
11387	AC	6-12"	Dark brown (10YR 4/3 moist) silty clay loam. Weak fine subangular blocky structure. Friable moist, hard dry. Numerous hard lime concretions 1/8 to 3/8" in diameter. Violent effervescence. Clear wavy boundary.
11388	C_1	12-20"	Dark brown (10Y 4/3 moist) crushes to (10YR 5/3 moist) silty clay loam. Weak coarse subangular blocky structure. Very friable moist, slightly hard dry. Few faint medium gray mottles and few distinct fine yellowish brown and brown iron stains. Violent effervescence; scattered hard lime concretions 1/8 to 1/2" in diameter. Gradual smooth boundary.
11389	C_2	20-36"	Light olive brown (2.5Y 5/3 moist) silty clay loam. Weak coarse prismatic structure. Very friable moist, slightly hard dry. Common fine, distinct strong brown and dark brown iron stains. Violent effervescence; few scattered lime concretions and small pores and openings filled with lime. Gradual smooth boundary.
11390	C_3	36-48"	Similar to horizon above. Consistence is soft dry. Dark brown iron stains are common, distinct, medium. Gradual smooth boundary.
11391	C_4	48-60"	Light olive brown (2.5Y 5/3 moist) silty clay loam. Massive.

SOIL SURVEY LABORATORY Lincoln, Nebr. May 1959

SOIL TYPE Dawes loam LOCATION Deuel County, Nebraska

SOIL NOS. S58Nebr-25-3-(1-7) LAB. NOS. 9403-9409

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<10mm)	

Soil type: Dawes loam

Location: .2 mile east and 180 feet south of northwest corner Sec. 4, T12N, R4SW; approximately 3 miles south and 1 mile east of Chappell, Deuel County, Nebraska.
Physiography: Loess-covered gravel plain.
Relief: Nearly level.
Slope: Less than 1 percent.
Parent material: Loess over Pleistocene gravels.
Drainage: Well drained.
Permeability: Moderately slow.
Salt or alkali: None.
Land use: Wheat 1958.
Climate: Average annual precipitation 18.5 inches; average annual temperature 49°F.
Collected by and date: John Elder, W. McKinzie and Robert Jordan, Oct. 23, 1958.

Lab. No.	Horizon	
9403	Alp	0-6", Grayish brown (10YR 5/2dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
9404	A2	6-8", Gray (10YR 6.5/1 dry) to dark gray (10YR 4/1 moist) very fine sandy loam; weak medium subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
9405	B2	8-16", Dark grayish brown (10YR 3.5/2) to very dark brown (10YR 2/2 moist) silty clay loam; moderate medium and coarse columnar breaking to moderate fine and medium blocks; dry hard, moist firm; noncalcareous; clear smooth boundary.
9406	B3	16-24", Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak coarse prismatic; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
9407	C1	24-32, Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
9408	C2	32-40", Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; abrupt smooth boundary.
9409	D	40-51", Fine to coarse Pleistocene gravels, well rounded.

Scattered gravels throughout the profile. Horizons Alp, B2 and C1 sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. May 1959

SOIL TYPE Dawes loam **LOCATION** Deuel County, Nebraska

SOIL NOS. S58Nebr-25-4-(1-7) **LAB. NOS.** 9410-9416

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-5	A1p	3.4	3.5	2.3	3.4	14.5	55.3	17.6	51.7	19.8	10	sil
5-7	A2	4.2	3.6	2.6	4.0	15.3	57.7	12.6	54.8	20.1	Tr.	sil
7-14	B2	0.6	0.7	0.5	1.1	8.5	38.8	49.8	34.1	13.8	-	c
14-17	B3	0.3	0.4	0.2a	0.8a	13.9a	62.9	21.5	50.8	26.5	-	sil
17-25	C1	0.1	0.3	0.2b	1.0b	20.4b	65.2	12.8	61.3	25.0	-	sil
25-33	C2	1.1b	0.7b	0.5b	1.4b	24.6b	60.7	11.0	65.3	20.9	Tr.	sil
33-44	D	18.6	23.9	17.8	25.7	3.7	3.7	6.6	14.5	2.3	44	cos

pH			ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1a 1:1	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC×10³ MILLIMHOS PER CM 8A1a	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.4			1.19	0.116	10.2	<0.20	0.5					8.0

[redacted]

Soil type: **Daves loam**
Soil No.: S58Nebr-25-4-(1-7)
Location: .2 mile south and 180 feet west of northeast corner Sec. 6, T12N, R45W; approximately 3.5 miles south and .5 mile west of Chappell, Deuel County, Nebraska.
Physiography: Loess-covered gravel plain.
Relief: Slight.
Slope: Less than 1 percent, plain.
Parent material: Loess over Pleistocene gravels.

[redacted]

Salt or alkali: None.
Land use: Wheat 1958.
Climate: Average annual precipitation 18.5 inches; average annual temperature 49°F.
Collected by and date: John Elder, W. McKinzie and Robert Jordan, Oct. 23, 1958.

Lincoln
Lab.
No. Horizon

9410 Alp 0-5", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.

[redacted]

SOIL SURVEY LABORATORY
Mandan, North Dakota

SOIL TYPE Exline silt loam

SOIL NO. S51Nebr-40-7-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2 (<19mm)	TEXTURAL CLASS
917	0-5	A1	0.1	0.3	0.8	3.2	16.5	60.4	18.7	18.3	60.3	-	sil
918	5-10	A2	0.1	0.3	0.6	1.9	18.7	59.5	18.9	16.7	62.5	-	sil
919	10-18	B2	-	0.3	0.7	1.8	13.7	46.3	37.2	15.3	45.8	-	sicl
920	18-21	B3	-	0.2	0.5	0.9	11.9	42.4	44.1	15.3	39.5	-	sic
921	21-28	Bcacs	0.7	0.7	0.6	1.2	14.9	48.0	33.9	19.0	44.5	1 a	sicl
922	28-42	C1	0.8	0.6	0.6	1.1	15.3	52.7	28.9	20.9	47.7	3 a	sil
923	42-47	C2	2.3	2.3	1.3	1.9	15.1	53.5	23.6	22.4	47.3	9 a	sil
924	47-60	C3	0.5	0.8	0.6	1.2	18.3	54.3	24.3	20.1	53.2	1 a	sil

	pH			ORGANIC MATTER			8A2 EST. % SALT	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM	CaCO3 equivalent	GYPSUM	MOISTURE TENSIONS (per cent)		
	SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N	(BUREAU CUP)	8A1a	per cent 6E1a	me./100g SOIL 6E1a	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS. 4B2
	5.8	6.1	6.7	3.16			-	0.6	tr	-			10.9
	6.0	6.8	7.1	1.59			-	0.7	tr	-			9.0
	7.2	8.2	8.6	1.21			-	1.5	tr	-			10.4

[redacted]

Soil type: Ekline silt loam
Soil No.: S51Nebr-40-7-(1-8)
Location: SW1/4, SE1/4, Sec. 10, T11N, R11W, Hall County, Nebraska.
Vegetation: Native pasture; saltgrass, grama, and western wheat grass dominant.
Parent material: Loess.
Physiographic position: Undulating terrace with numerous micro depressions.
Topography: Level.
Slope: Less than 1 percent.
Erosion: None or slight.
Drainage: Very slow.
Moisture: Moist.
Stoniness: None.
Root distribution: Good.
Described by: B. H. Williams.
Date: October 8, 1951.

Mandan Lab.No.	Horizon	
917	A1	0-5 inches. Silt loam; dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist); fine granular; soft; friable.
918	A2	5-10 inches. Silt loam; grayish brown (10YR 5/2 dry) to very dark gray (10YR 3/1 moist) silt loam, coarse blocky or prismatic primary and fine blocky secondary breakage. The structure aggregates are coated with lighter-colored material than the base color above.
919	B2	10-18 inches. Silty clay; very dark brown (10YR 2/2 dry) and only slightly darker when moist, silt clay; strongly developed coarse columnar-prismatic structure with secondary breakage to medium and fine blocky. The structure aggregates are heavily coated with black shiny organic colloids. The columns become ill-defined in their lower parts and grade into the next layer below.
920	B3	18-21 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 slightly moist), silty clay or heavy silty clay loam; medium to fine blocky; firm moist, moderately hard dry; moderately plastic wet.
921	Bca-cs	21-28 inches. Silty clay loam; light gray (5Y 7/2 dry) to olive gray (5Y 5/2 moist) silty clay loam; no well defined structure but crushes to fine subangular blocky mass; very high in salts, probably gypsum and scattered hard lime carbonate concretions. The soil mass generally is not calcareous.
922	C1	28-42 inches. Silt loam; pale yellow (5Y 6.5/3 dry) to pale olive (5Y 5.5/3 moist); massive friable; calcareous, including small and large (1-inch diameter) lime concretions.
923	C2	42-47 inches. Silt loam; light gray (5Y 7/2.5 dry) to olive gray (5Y 5/2.5 moist) silt loam; massive friable; strongly calcareous, including moderate abundant lime concretions, some up to 2 or 3 inches in their largest diameters. Common, reddish brown and yellowish red, small, distinct mottlings.
924	C3	47-60 inches. Silt loam; pale yellow (5Y 7/3 dry) to olive (5Y 5/3 moist); massive friable; moderately calcareous; scattered lime concretions; numerous mottlings, marblings and staining of yellow and brown coloration.

Note: Sampled from Ekline soil complex area of about mid-position in the micro topography.

SOIL SURVEY LABORATORY Lincoln, Nebr. May 1959

SOIL TYPE Goshen silt loam **LOCATION** Deuel County, Nebraska

SOIL NOS. S58Nebr-25-1-(1-7) **LAB. NOS.** 9389-9395

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-5	A1p	0.2	0.6	1.8	7.7	23.0	47.8	18.9	58.2	17.6	-	l
5-13	A12	0.3	0.8	2.2	10.4	23.7	41.5	21.1	57.7	14.1	Tr.	l
13-24	B21	0.3	0.8	2.3	10.0	23.0	38.8	24.8	54.4	13.8	Tr.	l
24-30	B22	0.1	0.4	1.2	6.5	24.3	42.7	24.8	56.5	14.9	Tr.	l
30-37	B3	0.1	0.3a	0.9a	4.7a	28.7a	47.3	18.0	63.0	16.3	Tr.	l
37-47	Cca	0.3a	0.7a	1.8a	7.7a	29.1a	44.3	16.1	63.2	15.3	Tr.	l
47-60	D	1.0	2.8	9.5	35.5	23.4	10.0	17.8	50.9	3.9	Tr.	fsl

pH 8C1a			ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6F1a $CaCO_3$ equiv. %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
1:1	1:5	1:10										

Soil type: Goshen silt loam
Soil No.: S58Nebr-25-1-(1-7)
Location: 450 feet east and 180 feet north of southwest corner Sec. 21, [redacted]

Springs, Deuel County, Nebraska.
Physiography: Swale in loess-mantled residual uplands.
Relief: Slight.
Slope: Less than 1 percent, plain.
Aspect: Just below footslope position.
Parent material: Loess and alluvium.
Drainage: Well drained.
Permeability: Moderate.
Salt or alkali: None.
Land use: Wheat 1958.
Climate: Average annual precipitation 18.5 inches; average annual temperature 49° F
Collected by and date: John Elder, W. McKinzie and Robert Jordan, October 23, 1958.

Lincoln Lab. No.	Horizon	
9389	A1p	0-5", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky; dry slightly hard, moist friable; noncalcareous; abrupt smooth boundary.
9390	A12	5-13", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam: weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
9391	B21	13-24", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) light silty clay loam; moderate coarse prismatic breaking to moderate fine and medium subangular blocks; dry slightly hard, moist friable; noncalcareous; clear smooth boundary.
9392	B22	24-30", Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry soft, moist very friable; noncalcareous; clear smooth boundary.
9393	B3	30-37", Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry soft, moist very friable; slight effervescence; gradual smooth boundary.
9394	Cca	37-47", Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; abrupt smooth boundary.
9395	D	47-60", Very pale brown (10YR 7/3 dry) to reddish yellow (7.5YR 6/6 moist) loam; massive; dry soft, moist very friable; violent effervescence.

NOTE: D horizon - Tertiary material - Ogallala. Few scattered medium gravels throughout the profile. Worm activity throughout profile and very prominent in the B3 horizon. Horizons A1p, B21 and Cca were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. May 1959

SOIL TYPE Goshen silt loam **LOCATION** Deuel County, Nebraska

SOIL NOS. S58Nebr-25-2-(1-7) **LAB. NOS.** 9396-9402

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)								3A1	2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-7	A1p	0.1	0.7	1.1	4.4	27.5	46.7	19.5	60.5	16.7	-	1

Soil type: Goshen silt loam
Soil No.: S58Nebr-25-2-(1-7)

[redacted]

R45W; approximately 1.5 miles east and 3 miles north of Chappell, Deuel County, Nebraska.
Physiography: Low-lying area in loess-mantled residual uplands.
Relief: Slight.
Slope: Less than 1 percent, plain.
Aspect: Just below footslope position.
Parent material: Loess and alluvium.
Drainage: Well drained.
Permeability: Moderate.
Salt and alkali: None.
Climate: Average annual precipitation 18.5 inches; average annual temperature 49°F.
Land use: Wheat 1958.
Collected by and date: John Elder, W. McKinzie and Robert Jordan, Oct. 23, 1958.

Lincoln Lab. No.	Horizon	
9396	A1p	0-7", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak medium and coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
9397	A12	7-14", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak medium subangular blocky; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
9398	B21	14-21", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; gradual smooth boundary.
9399	B22	21-30", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
9400	B3	30-36", Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry slightly hard, moist very friable; violent effervescence; gradual smooth boundary.
9401	Cca	36-47", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.

SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Hall silt loam

SOIL NO. S51Nebr-40-11-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	> 2 (>19mm)	
949	0-8	A1p	0.1	0.3	0.6	3.0	23.5	48.3	24.2	12.8	60.6	-	1
950	8-18	A12	0.1	0.2	0.6	1.6	24.7	46.3	26.5	9.8	62.0	-	1
951	18-21	AB	0.1	0.2	0.5	1.0	12.1	50.7	35.4	16.1	47.1	-	sicl

Soil type: Hall silt loam
Soil No.: S51Nebr-40-11-(1-7)
Location: About 900 feet north and 100 feet east of SW corner, Sec. 5, T11N, R11W, Hall County, Nebraska.
Vegetation: Cultivated, wheat stubble.
Parent Material: Loess.
Physiographic position: Terrace.
Topography: Gentle undulating plain.
Slope: Less than 1 percent.
Erosion: None or slight.
Drainage: Good.
Moisture: Moist.
Stoniness: None.
Described by: B. H. Williams.
Date: October 10, 1951.

Mandan Lab.No.	Horizon	
949	A1p	0-8 inches. Dark gray (10YR 4.5/1 dry) to very dark brown (10YR 2/2 moist) silt loam; fine soft granular; friable.
950	A12	8-18 inches. Same as above except weak blocky breakage.
951	AB	18-21 inches. This is a kind of B1 in which there is incipient graying along the structure planes as in an A2 horizon. Dark gray (10YR 4/1 dry) to very dark grayish brown (10YR 2.5/2 moist) light silty clay loam; medium to fine blocky-granular.
952	B2	21-32 inches. Grayish brown (2.5Y 5/2 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay loam; medium blocky; slightly hard dry; friable moist; slightly sticky wet.
953	B3	32-41 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) heavy silt loam; weak blocky; friable.
954	C1	41-56 inches. Mixed light and dark silt loam sedimentary layers; marbling through mixing by rodents and insects.
955	C2	56-62 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) silt loam; massive; friable; calcareous. This is a dark sedimentary layer or the A1 of a former weakly developed soil.

Note: This sample is from the same general soil association area of Wood River and Hall soils noted under Profile No. S51-Nebr-40-10-(1-8).

1174-1182

SOIL SURVEY LABORATORY — SOIL TYPE Hall silt loam

Mandan, North Dakota — SOIL NO. S52Nebr-40-2-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2	TEXTURAL CLASS
1174	0-5	A1p	—	0.2	0.4	1.8	15.4	58.6	23.6	16.9	58.4	—	sil
1175	5-14	A12	—	0.1	0.3	1.0	13.5	55.8	29.3	16.3	53.7	—	sicl
1176	14-18	A3B1	—	0.1	0.2	0.7	12.0	52.4	34.6	15.5	49.4	—	sicl
1177	18-24	B2	—	—	0.2	0.9	16.9	49.8	32.2	11.5	55.9	—	sicl
1178	24-27	B31	—	—	0.2	1.1	23.6	51.4	23.7	8.7	67.0	—	sil
1179	27-38	B32	—	0.1	0.7	2.2	29.2	50.5	17.3	9.3	71.8	—	sil
1180	38-50	C1	—	—	0.2	11.2	38.1	38.5	12.0	5.3	81.5	—	l
1181	50-52	A1b	—	—	0.2	1.8	13.2	63.1	21.7	22.9	55.0	—	sil
1182	52-60	C1b	—	—	0.2	1.2	13.6	67.7	17.3	17.7	64.3	—	sil

	pH			ORGANIC MATTER			8A2				MOISTURE TENSIONS		
	SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N	EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	1/10 ATMOS.	(per cent) 1/3 ATMOS.	15 ATMOS. 4B2
	5.9	6.8	6.9	1.84			—	0.4	tr	—			10.9
	5.8	6.7	6.8	1.62			—	0.3	tr	—			13.9
	5.9	6.9	7.0	1.22			—	0.2	—	—			16.8
	6.0	7.1	7.2	0.72			—	0.2	tr	—			11.8
	6.2	7.3	7.4	0.48			—	0.3	—	—			15.7
	6.5	7.6	7.7	0.27			—	0.3	tr	—			8.8
	6.6	7.6	7.7	0.12			—	0.4	tr	—			6.1
	6.5	7.7	7.6	0.20			—	0.4	tr	—			11.2
	6.6	7.7	7.8	0.14			—	0.4	—	—			10.0

	5A1a CATION EXCHANGE CAPACITY	5B1a CATIONS EXTRACTABLE Ca	Mg	5B1b EXCHANGEABLE Na	K	5D2 EXCHANGEABLE SODIUM PERCENTAGE	SATURATION EXTRACT SOLUBLE 8A1 6P1a Na	6Q1a K	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
	NH_4OAc	6N2b	6O2b	6P2a	6Q2a	ESP							
		milliequivalents per 100g soil →					← milliequivalents per liter →						
	21.3	13.2	4.4	0.1	1.7	—	0.2	0.8					40.2
	23.7	15.3	4.5	0.1	0.8	—	0.2	—					52.5
	26.5	17.3	5.2	0.3	0.9	1	0.2	0.2					59.6
	24.9	16.4	6.0	0.3	1.3	1	0.2	0.2					61.0
	19.6	12.9	4.7	0.3	1.1	2	0.2	0.2					52.5
	15.6	10.4	3.7	0.1	1.2	1	0.2	0.5					46.5
	11.0	7.7	2.8	0.3	1.0	3	0.6	0.8					38.7
	20.1	13.6	4.2	0.3	2.0	1	0.2	0.8					46.8
	18.4	12.7	3.8	0.3	2.1	2	0.6	0.8					45.5

AGN SCS BELTSVILLE, MD 2682 JUNE 1963

Soil type: Hall silt loam
Soil No.: S52Nebr-40-2-(1-9)
Date: September 1952
County: Hall County, Nebraska.
Location: NE1/4 of NE1/4 Sec. 9, T10N, R11W, about 700 feet south and 100 feet west of northeast corner of section.
Described by: B. H. Williams.
Mandan

Lab.No.	Horizon	
1174	A1p	0-5 inches. Very dark gray (10YR 3/1 moist) to gray (10YR 5/1 dry) friable, granular silt loam.
1175	A12	5-14 inches. Very dark brown (10YR 2/2 moist) to dark gray (10YR 4/1 dry) silt loam; breaks out in large irregular blocks but crushes easily; slightly moist to medium granules.
1176	A3B1	14-18 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) coarse granular to weak subangular blocky, friable, heavy silt loam.
1177	B2	18-24 inches. Dark grayish brown (10YR 3.5/2 moist) to grayish brown (10YR 5/1.5 dry) silty clay loam (probably on light side); medium blocky but crushes to fine blocks and coarse granules.
1178	B31	24-27 inches. Brown (10YR 5/3 moist) to pale brown (10YR 6/3 dry) blocky, friable, silt loam.
1179	B32	27-38 inches. Dark brown (10YR 4/3 moist) to pale brown (10YR 6/3 dry) weak blocky light silt loam or very fine sandy loam; soft, friable, moist.
1180	C1	38-50 inches. Grayish brown (2.5Y 6/2 moist) to light brownish gray (2.5Y 6/2 dry) massive, friable, very fine sandy loam.
1181	A1b	50-52 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6.5/2 dry) weak blocky, friable, silt loam, high in coarse silt or very fine sand.
1182	C1b	52-60 inches. Grayish brown (2.5Y 5/2 moist) to light gray (2.5Y 7/2 dry) massive, friable, silt loam or very fine sandy loam.
--		60+ inches. A heavy silt loam, same color as above horizon. No free lime carbonate to 64 inches.

Note: Coarse sand substratum is found at depth of 5 to 7 feet in this general area.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1963

SOIL TYPE Hastings silt loam **LOCATION** Adams County, Nebraska

SOIL NOS. S59Nebr-1-1 **LAB. NOS.** 11202-11213

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-5	A1p	-	-	Tr.	0.3	13.3	62.8	23.6	60.1	16.2	-	sil
5-9	A12	-	-	Tr.	0.2	11.6	56.4	31.8	50.9	17.2	-	sicl
9-12	B1	-	-	Tr.	0.3	9.2	52.2	38.3	46.0	15.6	-	sicl
12-20	B21	-	-	Tr.	0.2	7.9	50.1	41.8	40.7	17.5	-	sic
20-26	B22	-	-	Tr.	0.1	6.4	56.9	36.6	45.1	18.2	-	sicl
26-32	B3	-	-	0.1	0.5	7.8	62.0	29.6	51.0	19.1	-	sicl
32-43	Cca1	0.1b	0.1b	0.1b	0.7a	8.7a	69.6	20.7	54.1	24.7	Tr.	sil
43-53	Cca2	0.1b	0.2b	0.2b	0.8a	8.5a	68.2	22.0	53.8	23.4	Tr.	sil
53-62+	C1	0.1b	0.2b	0.2b	0.7a	8.1a	69.6	21.1	53.6	24.6	Tr.	sil
69-84	C2	Tr.	0.1b	0.1b	0.6a	6.4a	69.6	23.2	53.5	22.9	-	sil

Soil type: Hastings silt loam
Soil No.: 859Nebr-1-1
Location: 175 feet south and 130 feet east of northwest corner Sec. 15, T6N, R11W, Adams County, Nebraska.
Elevation: 1,980 feet.
Climate: Subhumid; average annual precipitation 24.6 inches; average annual temperature 51° F.
Crops: Wheat, 1958; summer fallow, 1960.

Parent material: Peorian loess.
Physiography: Upland plain.
Relief: Nearly level.
Slope: Less than 1 percent southeast.
Erosion: Slight.
Drainage: Moderately slow.
Ground water: Deep.
Permeability: Moderately slow.
Moisture: Moist to 5 feet.
Salt or alkali: None.
Stoniness: None.
Root distribution: No restrictive zone.
Date: June 17, 1959. Described by: Ross Greenawalt.

Horizon and Lincoln Lab. Number	
Alp 11202	0 to 5 inches. Dark grayish brown (10YR 4/2 dry), very dark brown (10YR 2/2 moist), and very dark brown (10YR 2.5/2 moist crushed) silt loam; coarse clods breaking to weak very fine granular structure; slightly hard, dry; friable, moist; noncalcareous; abrupt smooth boundary.
A12 11203	5 to 9 inches. Very dark grayish brown (10YR 3.5/2 dry), very dark gray (10YR 3/1 moist), and very dark grayish brown (10YR 3/2 moist crushed) heavy silt loam; weak medium and coarse angular blocky breaking to moderate fine and very fine granular structure; slightly hard, dry; friable, moist; noncalcareous; clear, smooth boundary.
B1 11204	9 to 12 inches. Dark grayish brown (10YR 4/2 dry), very dark grayish brown (10YR 3/2 moist), and very dark grayish brown (10YR 3.5/2 moist crushed) silty clay loam; moderate fine subangular blocky structure; thin discontinuous clay films; hard, dry; firm, moist; noncalcareous; clear smooth boundary.
B21 11205	12 to 20 inches. Grayish brown (10YR 5/2.5 dry), dark brown (10YR 3/3 moist), and olive brown (2.5Y 4/3 moist crushed) heavy silty clay loam; moderate fine and medium subangular blocky; thin continuous clay films; hard, dry; firm, moist; noncalcareous; gradual smooth boundary.
B22 11206	20 to 26 inches. Brown (10YR 5/3 dry), dark brown (10YR 4/3 moist), and olive brown (2.5Y 4/4 moist crushed) heavy silty clay loam; moderate medium blocky structure; thin continuous clay films; hard, dry; firm, moist; noncalcareous; gradual smooth boundary.
B3 11207	26 to 32 inches. Pale brown (10YR 6/3 dry), yellowish brown (10YR 5/4 moist), and grayish brown (10YR 5/2.5 moist crushed), few faint fine strong brown mottles, heavy silt loam; weak coarse and medium angular blocky structure; hard, dry; friable, moist; noncalcareous, however, a few soft lime segregations are present in the lower inch; gradual smooth boundary.
Ccal 11208	32 to 43 inches. Light gray (10YR 7/2 dry), light olive brown (2.5Y 5/4 moist), and olive brown (2.5Y 4.5/4 moist crushed), few distinct fine dark brown mottles, silt loam; weak coarse angular blocky structure; slightly hard, dry; friable, moist; strong effervescence; (lime mostly as small soft segregations); clear wavy boundary.
Cca2 11209	43 to 53 inches. Light gray (10YR 7/2 dry), light olive brown (2.5Y 5/3 moist), and brown (10YR 5/3 moist crushed), few distinct fine brown mottles, silt loam; weak coarse prismatic with weak fine platy secondary structure; slightly hard, dry; friable, moist; strong effervescence; (lime disseminated and on faces of peds); gradual smooth boundary.
C1 11210	53 to 62+ inches. Light gray (2.5Y 7/2 dry), grayish brown (2.5Y 5/2 moist), and light olive brown (2.5Y 5/3 moist crushed) silt loam; weak coarse prismatic with fine platy secondary structure; slightly hard, dry; friable, moist; strong effervescence; (lime disseminated and on faces of peds); gradual smooth boundary.
C2 11211	69 to 84 inches. Light gray (10YR 7/2 dry), yellowish brown (10YR 5.5/4 moist), and brown (10YR 5/3 moist crushed) silt loam; slightly hard, dry; friable, moist; slight effervescence.

Note: Numerous fine and very fine pores from 20 to 62 inches. Samples 69 to 120 inches taken with orchard auger. In deep cuts, the lower horizons have weak coarse prismatic structure. The very fine sands include approximately 50 percent quartz, 20 percent identified feldspar, and 15 percent highly altered grains. Glass shards increase from 5 percent in the solum to 15 percent in the C horizons. The pattern of feldspar alteration changes little with depth. Many of the identified feldspar grains, also somewhat altered, are probably albite. Accessory minerals in order of decreasing abundance are chlorite(?), which increases with depth, amphibole, epidote, and plant opal (restricted to upper horizons largely). (Method 7B1) This profile description used in Guide for Tour III, Seventh Congress of the International Society of Soil Science, August 1960.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1963

SOIL TYPE Hastings silt loam **LOCATION** Adams County, Nebraska

SOIL NOS. S61Nebr-1-1 **LAB. NOS.** 15723-15731

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	

Soil type: Hastings silt loam
Soil No.: S61Nebr-1-1
Location: 150 feet east and 150 feet north of S1/4 corner Sec. 23, T6N, R11W, Adams County, Nebraska.
Topography: Nearly level, less than 1/2 percent slope.
Crop: Fallow ground the summer of 1961. Described by: Herbert L. Kollmorgen.

Horizon and Lincoln Lab. Number	
A1p 15723	0 to 6 inches. Very dark brown (10YR 2/2 moist) silt loam. Weak fine crumb; very friable moist; abrupt smooth boundary. Color was somewhat splotchy and had some 10YR 3/1 mixed with 2/2 in matrix.
A12 15724	6 to 9 inches. Very dark brown (10YR 2/2 moist) silty clay loam. Moderate medium and fine granular; friable moist; clear smooth boundary.
B1 15725	9 to 11 inches. Very dark brown (10YR 2/2 moist) silty clay loam. Moderate fine and very fine subangular blocky; friable moist; clear smooth boundary.
B21 15726	11 to 20 inches. Dark brown (10YR 3/3 moist) heavy silty clay loam or silty clay. Moderate medium and fine prismatic to moderate or strong medium and fine angular blocky; firm moist; clear wavy boundary; continuous clay skins. Organic stainings on cleavage planes; some dark fill in small channels or cracks.
B22 15727	20 to 25 inches. Dark grayish brown (10YR 4/2 moist) silty clay loam. Moderate medium and fine prismatic to weak coarse and medium subangular blocky; firm, moist; clear wavy boundary; thin and patchy clay skins. Dark organic stainings on cleavage planes; some dark fill in cracks and old channels.
B3 15728	25 to 35 inches. Brown (10YR 5/3 moist) light silty clay loam. Weak coarse subangular blocky; friable moist but somewhat brittle as it crushes; abrupt wavy boundary; some worm casts and pores; few common distinct dark brown mottles.
C1 15729	35 to 46 inches. Light brownish gray to pale brown (10YR 6/2.5 moist) silt loam. Massive; friable moist but somewhat brittle as it crushes; violent effervescence. This horizon split from C2 for sampling so no lower boundary indicated. Many fine pores and open root channels. Concentration of $CaCO_3$ on cleavage planes and in the former root channels; few fine faint dark brown mottles.
C2 15730	46 to 56 inches. This horizon was divided from C1 only for sampling; all characteristics and features continue the same from 35 to 56 inches of depth. Gradual wavy boundary at 56 inches.
C3 15731	56 to 72 inches. Pale brown (10YR 6/3 moist) silt loam. Massive; very friable moist; strong effervescence; free lime visible in old root channels. Many fine pores in matrix; few fine faint yellowish brown mottles and numerous fine dark brown mottles; matrix has a somewhat brittle feel when being crushed.

Remarks: The very fine sands include approximately 50 percent quartz, 20 percent identified feldspar, and 15 percent highly altered grains. Glass shards increase from 5 percent in the solum to 15 percent in the C horizons. The pattern of feldspar alteration changes little with depth. Many of the identified feldspar grains, also somewhat altered, are probably albite. Accessory minerals in order of decreasing abundance are chlorite(?), which increases with depth, amphibole, epidote, and plant opal (restricted to upper horizons largely). (Method 7B1)

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/21/55

SOIL TYPE Hastings silt loam **LOCATION** Clay County, Nebraska

SOIL NOS. S54Nebr-18-1-(1-8) **LAB. NOS.** 2358-2365

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	A1p	0.1b	0.1	0.1	0.3	15.0	59.3	25.1	57.5	16.9	-	sil
6-9	A12	-	-	0.1	0.2	9.1	57.1	33.5	48.0	18.3	-	sicl
9-12	B1	-	-	0.2	0.1	9.0	54.0	36.7	42.9	20.1	-	sicl
12-24	B21	-	-	-	0.1	7.3	53.4	39.2	38.9	21.8	-	sicl
24-33	B22	-	-	0.1	0.2	7.3	55.4	37.0	38.1	24.7	-	sicl
33-38	B3	-	-	0.2	0.3	9.8	57.7	32.0	42.7	24.9	-	sicl
38-48	C	-	0.1	0.1	0.3	10.7	62.5	26.3	47.4	26.0	-	sil
48-60	Cca	-	0.4	0.2	0.4	13.5	62.8	22.7	48.7	27.8	-	sil

pH			ORGANIC MATTER			ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1b 8A1c	8C1a	8C1a	6A1a	6B1a	EST% SALT		$CaCO_3$	GYPSUM			4B2

[redacted]

Soil type: Hastings silt loam
Soil No.: S54Nebr-18-1-(1-8)
Location: 1160 feet west and 100 feet south of northeast corner Sec. 19, T8N, R5W, Clay County, Nebraska.
Topography: East-northeast facing slope of about 2 percent in an undulating loess-mantled plain.
Land use: Cultivated, fallow 1954.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2358	A_{1p}	0-6"	Grayish brown (10YR 5/2, dry) to very dark grayish brown (10YR 2.5/2, moist) silt loam, moderate fine granular structure but breaks up somewhat cloddy when tilled dry; slightly hard, dry; friable, moist; abrupt smooth lower boundary.
2359	A_{12}	6-9"	Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2/2, moist) silt loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
2360	B_1	9-12"	Dark grayish brown (10YR 4/2, dry) to very dark grayish prismatic vertical cleavage with prisms separating easily to strong fine blocks; slightly hard, dry; friable, moist. Clear smooth lower boundary.
2361	B_{21}	12-24"	Grayish brown (10YR 5/2.5, dry) to dark brown (10YR 4/3, moist) heavy silty clay loam; compound moderate medium prismatic and strong fine blocky structure; hard, dry; firm, moist; moderate glaze on surfaces of blocks; some dark organic staining along vertical cleavage planes.
2362	B_{22}	24-33"	Pale brown (10YR 6.5/3, dry) to brown (10YR 5/3, moist) heavy silty clay loam; compound moderate medium prismatic and strong medium and fine blocky structure; hard, dry; firm, moist; slightly glazing on faces of blocks and some dark organic staining along vertical cleavage planes; gradual smooth lower boundary.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/20/55

SOIL TYPE Hastings silt loam LOCATION Clay County, Nebraska

SOIL NOS. S54Nebr-18-2-(1-8) LAB. NOS. 2366-2373

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		1A1b VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	Alp	-	0.1b	0.3	0.5	15.7	59.1	24.3	57.2	17.9	-	sil
6-10	A12	-	-	0.1b	0.2	9.5	57.8	32.4	46.8	20.6	-	sicl
10-15	B1	-	-	0.2	0.3	9.2	53.7	36.6	40.9	22.1	-	sicl
15-21	B21	-	-	-	0.1	6.9	55.6	37.4	38.3	24.2	-	sicl
21-31	B22	-	0.1b	0.1	0.1	7.5	56.0	36.2	39.2	24.3	-	sicl
31-39	B3	-	0.1b	0.1	0.2	11.2	55.4	33.0	43.4	23.3	-	sicl
39-47	C	0.1b	0.1	0.1	0.2	10.4	63.0	26.1	44.6	28.9	-	sil
47-60	Cca	0.2	0.1	0.1	0.2	9.7	64.8	24.9	44.2	30.4	-	sil

	pH		ORGANIC MATTER			ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1b SATUR	8C1a	8C1a	6A1a	6B1a	EST% SALT		$CaCO_3$	GYPSUM			4B2

Soil type: Hastings silt loam
Soil No.: S54Nebr-18-2-(1-8)
Location: .2 mile south and 300 feet west of northeast corner Sec. 24, T6N, R7W, Clay County, Nebraska.
Topography: On 2 percent east facing slope of undulating loess-mantled plain, but only 200 to 300 feet back (west) from a steep slope breaking to lower ground.
Land use: Cultivated, sorghum 1954.
Described by: B. H. Williams.

Mandan
Lab.
[redacted]

2366 A_{1p} 0-[redacted]6" Dark grayish brown (10YR 4.5/1.5, dry) to very dark grayish brown (10YR 2.5/2, moist) silt loam; moderate fine granular structure; soft, dry; friable, moist; in tillage when dry breaks to medium and coarse blocky clods with slightly hard dry consistence; abrupt smooth lower boundary.

2367 A_{12} 6-10" Dark grayish brown (10YR 4/1.5, dry) to very dark grayish brown (10YR 2.5/2, moist) silt loam; strong fine granular structure; soft, dry; friable, moist. When spaded up in nearly dry condition, the soil falls apart in large blocky clods, breaking along vertical cracking planes; clear smooth lower boundary.

2368 B_1 10-15" Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) light silty clay loam; compound weak coarse prismatic and strong fine blocky structure; slightly hard, dry; friable, moist; plant roots abundant; clear smooth lower boundary.

2369 B- 15-21" Grayish brown (10YR 5/2.5, dry) dark grayish brown (10YR

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coarse prismatic and strong medium and fine blocky structure; hard, dry; firm, moist; some dark brown staining along vertical cracking planes; gradual smooth lower boundary.

2370 B_{22} 21-31" Pale brown (10YR 6/3, dry) to brown (10YR 5/3, moist) silty clay loam; compound moderate medium and coarse prismatic and strong medium and fine blocky structure; dark brown staining along some of the vertical cracking planes; hard, dry; firm, moist; a fair number of living roots and numerous dead ones; clear smooth lower boundary.

2371 B- 31-39" Pale brown (10YR 6/3, dry) to brown (10YR 5/3.5, moist)

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/20/55

SOIL TYPE Hastings silt loam **LOCATION** York County, Nebraska

SOIL NOS. S54Nebr-93-1-(1-7) **LAB. NOS.** 2344-2350

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	0.1	0.2	0.2	0.6	9.6	64.1	25.2	54.1	19.8	-	sil
6-15	A12	-	-	0.4	0.4	7.8	56.6	32.6	44.4	22.1	-	sicl
15-20	B1	-	-	0.1	0.1	7.1	56.0	36.7	37.9	25.2	-	sicl
20-29	B21	-	-	-	0.6	6.5	54.3	38.6	39.2	21.8	-	sicl
29-37	B22	-	-	0.1	0.2	8.7	54.7	36.3	41.5	22.0	-	sicl
37-48	B3	-	-	0.3	0.5	8.3	58.3	32.6	43.9	22.9	-	sicl
48-60	C	-	0.1	-	0.2	11.6	60.7	27.4	48.0	24.4	-	sicl

8C1b SATURATED PASTE	pH 8C1a 1:5	8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
5.5	5.9	6.2	1.81	.166	10.9			-				9.9
5.7	6.4	6.5	1.47	.141	10.4			-				13.3
5.7	6.5	6.8	0.94	.095	9.9			-				15.1
5.9	6.6	6.9	0.55	.066	8.3			-				16.4
6.1	6.8	7.3	0.29					-				16.6
6.3	7.3	7.4	0.18					-				15.2
6.5	7.3	7.7	0.08					-				13.9

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K	BASE SAT. % 5C1	Na	K	5A3a Sum Cations me/100g.	8D3 Ca/Mg		MOISTURE AT SATURATION %
← milliequivalents per 100g. soil →												
19.7	10.9	3.3		-	2.0	82			16.2	3.3		
22.4	13.7	4.7		0.1	0.8	86			19.3	3.0		
24.6	13.5	5.8		0.1	0.6	81			20.0	2.3		
26.1	16.8	7.0		0.2	0.8	95			24.8	2.4		
26.9	18.1	7.7		0.3	1.2	100			27.3	2.4		
27.1	18.2	7.4		0.3	1.4	100			27.3	2.4		
25.8	17.6	7.0		0.4	1.5	100			26.5	2.5		

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Hastings silt loam
Soil No.: S54Nebr-93-1-(1-7)
Location: 150 feet south and 80 feet west of northeast corner Sec. 4, T10N, R2W, York County, Nebraska.
Topography: Nearly flat to 2 percent slope in gently undulating loess-

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mantled plain.
Land use: Cultivated, corn 1954.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2344	A_{1p}	0-6"	Grayish brown (10YR 4.5/2, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; fine granular structure; slightly hard and blocky or cloddy, dry; friable, moist; abrupt smooth lower boundary.
2345	A_{12}	6-15"	Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) heavy silt loam; weak coarse blocky separating to moderate or strong fine granular structure; slightly hard, dry; friable, moist; gradual smooth lower boundary.
2346	B_1	15-20"	Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) silty clay loam; weak coarse prismatic separating to strong fine and very fine blocky structure; faces of blocks slightly darker than interiors; hard, dry; firm, moist; gradual smooth lower boundary.
2347	B_{21}	20-29"	Grayish brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) heavy silty clay loam or silty clay; weak coarse prisms separating easily into strong medium and coarse blocky structure; hard, dry; firm, moist; moderate glaze on blocks; gradual smooth lower boundary.
2348	B_{22}	29-37"	Brown (10YR 5.5/3, dry) to light olive brown (2.5Y 5/3 moist) heavy silty clay loam; strong medium and coarse blocky structure, with moderate glaze on faces of blocks; hard, dry; firm, moist; gradual smooth lower boundary.
2349	B_3	37-48"	Pale brown (10YR 6/3, dry) to light olive brown (2.5Y 5/4, moist) silty clay loam; moderate medium blocky structure with slight glaze on faces of peds; slightly hard, dry; friable, moist; old root channels and a few live corn roots; gradual smooth lower boundary.
2350	C	48-60"	Pale brown (10YR 6.5/3, dry) to light olive brown (2.5Y 5/4 moist) heavy silt loam; massive; soft, dry; friable, moist; numerous faint fine pores or tube-like channels; no effervescence with dilute HCl.

Horizons A1p, A12, B21, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/20/55

OIL TYPE Hastings silt loam LOCATION York County, Nebraska

SOIL NOS. S54Nebr-93-2-(1-7) LAB. NOS. 2351-2357

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-5	A1p	-	0.6	0.5	0.9	12.5	61.3	24.2	54.4	19.8	-	sil
5-16	A12	-	-	0.1	0.2	8.4	57.9	33.4	45.1	21.3	-	sicl
16-21	B1	-	-	0.3	0.4	6.4	53.9	39.0	38.9	21.6	-	sicl
21-32	B21	-	-	0.1	0.2	8.1	52.8	38.3	40.3	20.7	-	sicl
32-42	B22	-	-	0.1	0.2	8.8	56.3	34.6	44.3	20.9	-	sicl
42-51	B3	-	-	0.4	0.3	10.7	59.5	29.1	46.7	23.6	-	sicl
51-60	C	-	0.2	-	0.4	15.5	59.7	24.2	51.6	23.8	-	sil

Soil type: Hastings silt loam
Soil No.: S54Nebr-93-2-(1-7)
Location: 180 feet north and 75 feet east of southwest corner Sec. 32, T10N, R3W, York County, Nebraska.
Topography: South facing 1 to 2 percent slope in gently undulating loess-mantled plain.
Land use: Cultivated, wheat 1954.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2351	A_{1p}	0-5"	Dark grayish brown (10YR 4/1.5, dry) to very dark brown (10YR 2/2, moist) silt loam; fine granular structure; forms slightly hard blocky clods when tilled dry; friable, moist; abrupt smooth lower boundary.
2352	A_{12}	5-16"	Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2.5/2, moist) silt loam; breaks out in coarse blocks or prisms but crushes to fine granular structure; slightly hard, dry; very friable, moist; clear smooth lower boundary.
2353	B_1	16-21"	Brown (10YR 4.5/3, dry) to dark brown (10YR 3/3, moist) silty clay loam; weak coarse prismatic separating easily to fine blocky structure; hard, dry; firm, moist; gradual smooth lower boundary.
2354	B_{21}	21-32"	Grayish brown (10YR 5/2.5, dry) to dark brown (10YR 4/3, moist) heavy silty clay loam or silty clay; weak coarse prisms separating easily to strong medium blocky structure; hard, dry; firm, moist; moderate glaze on blocky peds.
2355	B_{22}	32-42"	Pale brown (10YR 6/3, dry) to brown (10YR 5/3, moist) silty clay loam; moderate to strong medium blocky structure; hard, dry; firm, moist; some dark organic staining along the better defined vertical structure planes; gradual smooth lower boundary.
2356	B_3	42-51"	Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) heavy silt loam; moderate to weak medium and coarse blocky structure; slightly hard, dry; friable, moist; abundant thread-like pores and channels, some of which contain dead roots; gradual smooth lower boundary.

SOIL SURVEY LABORATORY Mandan, N. Dak. [a/] 9/20/55

SOIL TYPE Holdrege silt loam **LOCATION** Phelps County, Nebraska

SOIL NOS. S54Nebr-69-1-(1-8) **LAB. NOS.** 2178-2185

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-7	A1p	0.1	0.2	0.4	1.2	16.6	59.9	21.6	61.6	15.8	-	sil
7-11	A12	-	-	0.1	0.3	11.0	59.2	29.4	53.1	17.2	-	sicl
11-14	A3	-	0.1	0.2	0.5	11.7	56.1	31.4	51.3	16.9	-	sicl
14-21	B21	-	-	0.1	0.3	9.3	61.7	28.6	53.0	18.1	-	sicl
21-27	B22	-	0.1	0.2	0.7	11.6	64.4	23.0	56.6	19.8	-	sil
27-35	B3	-	0.1	0.2	0.9	15.8	66.3	16.7	61.8	20.9	-	sil
35-42	Bca	0.1	0.1	0.2	0.5	12.2	71.1	15.8	61.1	22.7	-	sil
42-60	Cca	0.2	0.3	0.3	0.8	16.3	65.6	16.5	60.4	22.0	-	sil

8C1b SATURATED PASTE	pH 8C1a 1:5	8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10³ MILLIMHOS PER CM	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
5.9	6.5	6.6	1.38	.120	11.5			-				10.0
6.2	6.9	6.9	1.13	.109	10.4			-				13.6
6.4	7.2	7.4	0.86	.088	9.8			-				14.7
6.7	7.3	7.8	0.49	.059	8.3			-				13.6
7.0	7.7	8.0	0.26	.038	6.8			-				11.4
7.3	8.1	8.2	0.08					-				10.4
7.8	8.7	8.9	0.12					2				10.0
7.9	8.9	9.1	0.09					3				9.9

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K	5R1a BASE SAT. %	Na	K	5A3a Sum Cations me/100g	8D3 Ca/Mg		MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →					5C1						
19.2	11.3	3.8		0.1	1.5	87			16.7	3.0		
23.7	16.0	5.6		0.1	1.0	96			22.7	2.8		
24.9	14.6	6.6		0.1	1.0	90			22.3	2.2		

Soil type: Holdrege silt loam
Soil No.: S54Nebr-69-1-(1-8)
Location: 325 feet east and 75 feet south of northwest corner Sec. 28, T6N, R18W. North of Holdrege, 2 miles north of intersection of Highways 6 and 183, Phelps County, Nebraska.
Topography: 2 to 3 percent west facing, smooth slightly convex slope, slight erosion; gently undulating loess plain with slight relief.
Use: Summer fallow 1954. Dryland farmed to corn and wheat. Operator knows of no past management practices which would affect chemical or physical properties of the soil in an unusual way. No lime, fertilizer or manure has been added; has not been irrigated; has been farmed many years, probably 40 years or longer.
Described by: B. H. Williams

Mandan Lab. No.	Horizon	Depth	
2178	A_{1p}	0-7"	Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) heavy silt loam; strong medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; numerous fragments of decaying straw and roots throughout; abrupt smooth boundary.
2179	A_{12}	7-11"	Dark gray (10YR 4/1.5, dry) very dark brown (10YR 2/2, structure; slightly hard dry, friable moist; noncalcareous; fine roots abundant; clear smooth boundary.
2180	A_3	11-14"	Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) crushing to 10YR 4/2.5, moist, silty clay loam; strong medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; fine roots abundant; clear smooth boundary.
2181	B_{21}	14-21"	Light brownish gray(10YR 6/2.5, dry) dark grayish brown (10YR 4/2.5, moist) silty clay loam; weak coarse prismatic breaking to strong medium and fine blocky structure; hard dry, friable moist; fine roots plentiful; numerous worm casts; noncalcareous; dark material from above has moved down cracks along faces of larger aggregates; clear smooth boundary.
2182	B_{22}	21-27"	Pale brown (10YR 6/3 dry) brown (10YR 5/3 moist) heavy silt loam; weak coarse prismatic breaking to moderate medium subangular blocky structure; hard dry, friable moist; noncalcareous; fine roots plentiful; clear smooth boundary.
2183	B_3	27-35"	Very pale brown (10YR 6/3, dry) light olive brown (2.5Y 5/4, moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocky structure; slightly hard dry, friable moist; noncalcareous with lower inch weakly calcareous; many fine and medium pores and root openings; few fine roots; abrupt boundary.
2184	B_{ca}	35-42"	Light gray (10YR 7/2, dry) light olive brown (2.5Y 5.5/4, moist) silt loam; weak very coarse prismatic to very weak medium subangular blocky structure; soft dry, very friable

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 1/20/55

SOIL TYPE Holdrege silt loam **LOCATION** Phelps County, Nebraska

SOIL NOS. S54Nebr-69-2-(1-8) **LAB. NOS.** 2188-2193

DEPTH		1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)								3A1	2A2	
		VERY				VERY						
0-7	Alp	-	0.3	0.5	1.6	14.2	61.4	22.0	59.1	17.5	-	sil
7-13	A12	-	0.1	0.2	0.7	11.0	58.4	29.6	53.5	16.4	-	sicl

Soil type: Holdrege silt loam
Soil No.: 354Nebr-69-2-(1-8)
Location: 350 feet north and 250 feet east of southwest corner Sec. 25, T6N, R19W; 1 mile north and 3 miles west of Holdrege, Phelps County, Nebraska. (North of school yard.)
Topography: Smooth, slightly convex 2 percent west facing slope with slight erosion. Gently undulating loess plain with slight relief.
Use: Summer fallow 1954. Wheat and summer fallow for past ten years with corn and wheat prior to that. Farmed for many years but no estimate of how many.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2186	A_{1p}	0-7"	Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure; soft, dry; very friable moist; abrupt smooth boundary.
2187	A_{12}	7-13"	Dark gray (10YR 4/1.5, dry) very dark brown (10YR 2.5/2, moist) heavy silt loam; strong medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; many fine pores, many worm casts; clear smooth boundary.
2188	A_3	13-16"	Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) light silty clay loam; strong medium and fine granular structure; slightly hard dry, friable moist; many fine roots; considerable mixing of soil material by insects; clear smooth boundary.
2189	B_{21}	16-24"	Grayish brown (10YR 5/2, dry) dark grayish brown (10YR 4/2, moist) mixed by insects, some movement of darker materials along aggregate faces, silty clay loam; weak coarse prismatic breaking to strong medium and fine blocky structure; hard dry, friable moist; many fine and medium pores and a few open insect burrows, abundant roots; noncalcareous; clear smooth boundary.
2190	B_{22}	24-30"	Light brownish gray (10YR 6/2.5, dry) brown (10YR 5/3, moist) silty clay loam; weak coarse prismatic breaking to moderate medium and fine subangular blocky structure; slightly hard dry, friable moist; many fine and medium pores; some large open insect burrows and a few insect burrows filled with darker soil materials; fine roots plentiful; noncalcareous; clear smooth boundary.
2191	B_3	30-34"	Pale brown (10YR 6/3, dry) grayish brown (10YR 5/2.5, moist) silt loam or light silty clay loam; moderate coarse prismatic breaking to moderate medium subangular blocky structure; slightly hard dry, very friable moist; many medium and fine pores, a few dark-colored worm casts; few fine roots; noncalcareous; clear smooth boundary.
2192	B_{ca}	34-42"	Light gray or pale brown (10YR 7/2.5, dry) light brownish gray (10YR 6/2.5, moist) silt loam with a few worm casts of darker material (10YR 5/3, moist) moderate coarse prismatic breaking to moderate medium to very coarse subangular blocky structure; few fine roots; calcareous throughout with many soft white concretions and spots of $CaCO_3$; many fine and medium pores and root openings, walls of most coated with $CaCO_3$; gradual smooth boundary.
2193	C_{ca}	42-60"	Light [illegible]

SOIL SURVEY LABORATORY — SOIL TYPE Nord silt loam

Mandan, N. Dak. — SOIL NO. S50Nebr-10-2-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 — VERY COARSE SAND 2-1 (1B1a)	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	>0.02	2A2 >2	TEXTURAL CLASS
313	0-5	A1p	-	0.4	1.1	6.2	15.8	58.7	17.8	13.6	64.8	-	sil
314	5-9	A12	-	0.3	1.3	7.9	14.5	56.6	19.4	14.0	62.0	-	sil
315	9-15	A13	-	0.4	1.7	10.0	16.3	52.6	19.0	15.0	60.3	-	sil
316	15-22	B1	-	-	1.5	10.6	16.4	49.1	22.4	13.0	59.2	-	l
317	22-31	B2	-	0.3	1.2	15.2	17.3	42.6	23.4	9.9	59.9	-	l
318	31-44	B3	-	0.1	1.0	10.2	19.3	49.6	19.8	11.0	65.1	-	l
319	44-62	C	0.1	0.5	1.9	11.2	18.2	51.3	16.8	14.0	62.3	-	sil

	pH — SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	ORGANIC MATTER — % ORGANIC CARBON 6A1a	% NITROGEN	C/N	EST. % SALT (BUREAU CUP) 8A2	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS (per cent) — 1/10 ATMOS.	1/3 ATMOS.	15 ATMOS. 4B2
313	6.2	6.7	6.9	1.41			-	1.2	tr	-			8.0
314	6.7	6.8	7.0	1.23			-	1.0	tr	-			8.5
315	7.2	7.4	7.5	1.14			-	0.5	-	-			8.4
316	7.5	7.6	7.8	0.82			-	0.6	tr	-			9.4
317	7.8	8.0	8.2	0.49			-	0.6	tr	-			10.7
318	8.1	8.4	8.6	0.29			-	0.6	-	-			9.6
319	9.2	9.4	9.7	0.17			-	1.5	2	-			8.4

	CATION EXCHANGE CAPACITY NH_4Ac 5A1a	CATIONS — EXTRACTABLE Ca 6N2b	Mg 6O2b	EXCHANGEABLE Na 6P2a	K 6Q2a (5B1a, 5B1b)	EXCHANGEABLE SODIUM PERCENTAGE ESP 5D2	SATURATION EXTRACT SOLUBLE 8A1 — Na 6P1a	K 6Q1a	CO_3	HCO_3	Cl	SO_4	PER CENT MOISTURE AT SATURATION 8A
		milliequivalents per 100g soil					milliequivalents per liter						
313	16.3	9.8	3.3	0.6	1.8	4	2.6	0.7					42.0
314	17.0	10.5	3.7	0.8	1.2	5	4.5	1.6					42.5
315	16.6	10.0	3.8	0.9	1.2	5	3.8	3.3					41.8
316	17.8	9.5	4.9	0.9	1.8	5	5.9	4.4					40.8
317	17.9	7.9	8.3	1.3	2.3	7	4.0	4.5					44.5
318	17.5	6.2	9.0	1.9	2.9	11	5.8	2.8					39.9
319	15.8			2.4	3.3	15	16.8	6.1					41.0

AGR-SCS-BELTSVILLE, MD 2682 JUNE 1969

Soil type: Hord silt loam
Soil No.: S50Nebr-10-2-(1-7)
Location: 50 feet south of road and 900 feet west of northeast corner of northwest quarter of Sec. 15, T9N, R13W, Buffalo County, Nebraska.
Topography: Platte River Valley terrace, slope under 1 percent.
Drainage: Moderately good.
Erosion: Little, if any.
Parent material: Stream reworked and deposited aeolian materials.
Land use: Irrigated corn in 1950.
Described by: B. H. Williams.
Date: July 12, 1950.

Horizon and Mandan Lab. Number	
A1p 313	0 to 5 inches. Silt loam; granular, friable, 10YR 3/2 moist; abrupt lower boundary.
A12 314	5 to 9 inches. Silt loam; large blocky, granular, friable, 10YR 2/2 moist; gradual boundary.
A13 315	9 to 15 inches. Silt loam; blocky, crumb, friable, 10YR 3/2 moist; gradual boundary.
B1 316	15 to 22 inches. Silt loam, heavy; blocky, crumb, friable, 10YR 3/2 moist; gradual boundary.
B2 317	22 to 31 inches. Silty clay loam, heavy; strong blocky, moderately hard, dry; friable, moist, 10YR 4/3 moist; gradual boundary.
B3 318	31 to 44 inches. Silty clay loam; strong blocky, friable, plastic, 10YR 5/2 moist; abrupt lower boundary.
C 319	44 to 62 inches. Silt loam; massive, friable, 2.5Y 8/4 moist, calcareous concretions.

SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Hord silt loam

SOIL NO. S51Nebr-40-12-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2 (<19mm)	TEXTURAL CLASS
956	0-6	A1p	0.3	0.3	0.9	1.7	18.6	53.4	24.8	15.2	57.3	-	sil
957	6-16	A12	0.1	0.2	0.5	1.8	14.5	61.5	21.4	17.2	59.9	-	sil
958	16-26	B2	0.1	0.2	0.5	4.1	10.4	57.8	26.9	18.4	53.0	-	sil
959	26-36	A1b	0.1	0.2	0.6	2.2	26.2	44.8	25.9	12.0	60.6	-	l
960	36-46	B21b	0.1	0.3	0.6	1.5	14.7	55.3	27.5	22.3	48.6	-	sicl-sil
961	46-56	B22b	0.1	0.2	0.4	1.4	6.7	55.9	35.3	24.6	38.6	-	sicl
962	56-66	C1bca	1.2	0.1	0.5	0.7	13.5	50.4	33.6	18.5	45.7	Tr. a	sicl

LABORATORY NUMBER	pH SATURATED PASTE 8C1b	pH 1:5 8C1a	pH 1:10 8C1a	ORGANIC MATTER % ORGANIC CARBON 6A1a	ORGANIC MATTER % NITROGEN	ORGANIC MATTER C/N	8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS 1/10 ATMOS.	MOISTURE TENSIONS (per cent) 1/3 ATMOS.	15 ATMOS. 4B2
956	6.3	6.7	6.8	1.62			-	0.5	tr	-			10.0
957	6.2	6.6	6.7	1.28			-	0.4	tr	-			10.4
958	6.0	6.5	7.0	0.62			-	0.4	tr	-			12.0
959	6.6	7.3	7.8	0.40			-	0.4	tr	-			12.5
960	7.2	8.0	8.3	0.38			-	0.5	tr	-			12.7
961	7.6	8.3	8.4	0.39			-	0.8	tr	-			16.2
962	7.6	7.7	7.8	0.28			0.20	3.6	2	34			16.2

LABORATORY NUMBER	5A1a CATION EXCHANGE CAPACITY NH4OAc	5B1a EXTRACTABLE CATIONS Ca 6N2b	5B1a EXTRACTABLE CATIONS Mg 6O2b	5B1b EXCHANGEABLE CATIONS Na 6P2a	5B1b EXCHANGEABLE CATIONS K 6Q2a	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1 6P1a Na	6Q1a K	CO3	HCO3	Cl	SO4	8A PER CENT MOISTURE AT SATURATION
	milliequivalents per 100g soil						milliequivalents per liter						
956	18.9	11.6	3.3	0.3	1.6	2	-	0.4					46.2
957	18.6	11.2	4.1	0.3	0.7	2	0.6	tr					52.1
958	18.9	9.7	6.7	0.3	1.2	2	0.9	0.2					54.1
959	19.4	9.3	5.6	0.8	2.2	4	1.5	0.2					50.7
960	20.3	9.7	7.2	1.1	3.0	5	1.7	0.4					46.8
961	25.1	13.8	8.3	1.2	3.8	5	3.5	1.2					59.2
962	23.9			0.9	3.5	4	7.8	4.5					62.7

a. Largely calcareous concretions.

AGR-SCS-BELTSVILLE, MD 8662 JUNE 1959

Soil type: Hord silt loam
Soil No.: S51Nebr-40-12-(1-7)
Location: SE1/4, NE1/4, Sec. 6, T11N, R11W, Hall County, Nebraska.
Vegetation: Oat stubble and sweet clover.
Parent material: Loess.
Physiographic position: Terrace.
Topography: Level plain.
Slope: 0.
Erosion: None or slight.
Drainage: Excellent.
Moisture: Moist.
Stoniness: None.
Root distribution: Good.
Described by: B. H. Williams.
Date: October 10, 1951.
Mandan

Lab.No.	Horizon	
956	A1p	0-6 inches. Dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist) silt loam, soft granular; friable when moist, soft to slightly hard when dry.
957	A12	6-16 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam; granular; friable.
958	B2	16-26 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam; subangular blocky, friable when moist; slightly hard when dry.
959	A1b	26-36 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; subangular blocky; friable.
960	B21b	36-46 inches. Grayish brown (10YR 5/2.5 dry) to dark gray (10YR 4/1.5 moist) silt loam; crumb; friable.
961	B22b	46-56 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam, friable.
962	C1bca	56-66 inches. Pale brown (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2 moist) heavy silt loam or light silty clay loam; subangular, blocky; thread-like streaks and medium-sized spots and flecks of calcium carbonate and other salts present; friable.

1192-1198

SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Hord silt loam

SOIL NO. S52Nebr-40-4-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2 (<19mm)	TEXTURAL CLASS
1192	0-6	A1p	0.2	0.5	0.9	1.9	14.5	61.6	20.4	15.1	62.2	—	sil
1193	6-16	A12	—	0.6	1.0	2.4	14.8	56.4	24.8	15.0	57.7	—	sil
1194	16-23	B21	—	0.4	0.9	2.1	18.0	53.9	24.7	12.1	61.1	—	sil
1195	23-35	B22	0.1	0.7	1.1	1.7	15.3	56.5	24.6	14.2	58.6	—	sil
1196	35-46	C	0.4	0.8	1.1	2.4	32.1	45.4	17.8	8.3	70.7	—	l
1197	46-58	D1	1.3	4.4	10.7	17.5	12.2	36.6	17.3	10.3	46.6	Tr.	l
1198	58-66	D2	0.5	1.1	1.2	1.6	2.2	59.5	33.9	41.8	20.7	—	sicl

LABORATORY NUMBER	pH SATURATED PASTE 8C1b	pH 1:5 8C1a	pH 1:10 8C1a	ORGANIC MATTER % ORGANIC CARBON 6A1a	ORGANIC MATTER % NITROGEN	ORGANIC MATTER C/N	8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6F1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS (per cent) 1/10 ATMOS.	MOISTURE TENSIONS (per cent) 1/3 ATMOS.	15 ATMOS. 4B2
1192	6.1	6.8	7.0	1.95			—	0.4	tr	—			10.7
1193	5.8	6.7	6.7	1.34			—	0.3	tr	—			12.6
1194	6.2	7.1	7.2	0.76			—	0.3	tr	—			12.2
1195	6.5	7.4	7.5	0.41			—	0.3	tr	—			12.3
1196	6.8	7.8	7.9	0.21			—	0.4	tr	—			9.4
1197	7.4	8.5	8.6	0.15			—	0.7	tr	—			8.6
1198	7.7	8.9	9.1	0.33			—	0.6	4	—			19.2

LABORATORY NUMBER	5A1a CATION EXCHANGE CAPACITY NH_4OAc	5B1a CATIONS EXTRACTABLE EXCHANGEABLE Ca 6N2b	Mg 6O2b	Na 6P2a	K 6Q2a	5B1b	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1 Na 6P1a	K 6Q1a	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
	milliequivalents per 100g soil							milliequivalents per liter						
1192	19.6	12.4	3.5	0.1	1.9	—		0.6	0.9					42.8
1193	20.6	12.2	4.0	0.1	1.7	—		0.2	0.5					46.4
1194	19.6	12.0	4.2	0.1	2.0	—		0.2	0.9					50.3
1195	20.0	12.4	4.9	0.1	2.2	—		0.6	0.5					53.3
1196	16.3	10.2	4.3	0.1	1.8	1		1.3	0.8					44.7
1197	15.1	10.2	4.4	0.3	1.8	2		2.2	0.9					36.1
1198	30.9			1.5	3.9	5		3.7	0.9					64.4

AGR-SCS BELTSVILLE, MD 2482 JUNE 1959

Soil Type: Hord silt loam
Soil No.: S52Nebr-40-4-(1-7)
Date: September 1952
County: Hall County, Nebraska.
Location: 150 feet north and 100 feet west of southeast corner Sec. 31, T11N R10W.
Described by: B. H Williams.
Mandan

Lab.No.	Horizon	
1192	A1p	0-6 inches. Very dark gray (10YR 3/1 moist) to gray (10YR 5/1 dry) fine granular, friable, silt loam.
1193	A12	6-16 inches. Very dark brown (10YR 2/3 moist) to dark gray (10YR 4/1 dry) granular, friable, silt loam.
1194	B21	16-23 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) weak medium blocky, friable, heavy silt loam; includes 1- or 2-inch layer E1 transition.
1195	B22	23-35 inches. Dark grayish brown (10YR 4/2 moist) to light brownish gray (10YR 6/2 dry) medium blocky, friable, heavy silt loam.
1196	C	35-46 inches. Grayish brown (10YR 5/2 moist) to light brownish gray (10YR 5.5/2 dry) massive to weak subangular blocky, friable, silt loam containing a fairly high proportion of coarse silt and noticeable very fine sand.
1197	D1	46-58 inches. Pale brown and grayish brown, moist, stratified silt loam, loam, fine sandy loam and loamy sand alluvium. Strata appreciably distorted from the horizontal.
1198	D2	58-66 inches. Dark grayish brown (10YR 4/2 moist) to light brownish gray (10YR 6/2 dry) massive to weak blocky silt loam; friable, an old dark colored soil or dark sedimentary layer; strongly calcareous, including an abundance of white spots and seams of lime carbonate. None of the white spots seem to be of other kinds of salts.

Note: Auger examination below 66 inches; from 66 to 112 inches is loamy alluvium that becomes sandier with depth; fine sand below 112 inches.

1199-1207

SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Hord silt loam

SOIL NO. S52Nebr-40-5-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
			VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			> 2	
			2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	<0.002	0.02-0.002	[illegible]		

Soil Type: Hord silt loam
Soil No.: S52Nebr-40-5-(1-9)
Date: September 1952
County: Hall County, Nebraska.
Location: NW1/4 of SW1/4 of Sec. 10, T10N, R11W.
Described by: B. H. Williams.
Mandan

Lab.No.	Horizon	
1199	A1p	0-6 inches. Dark gray (10YR 4/1 moist) to gray (10YR 5/1.5 dry) granular, friable, silt loam.
1200	A12	6-11 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) granular, friable, silt loam.
1201	B21	11-19 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) medium blocky, friable, heavy silt loam; includes probably 1 inch of AB transition.
1202	B22	19-24 inches. Dark grayish brown (10YR 4/2 moist) to light brownish gray (10YR 6/2 dry) heavy silt loam; weak blocky, friable.
1203	B31	24-31 inches. Pale brown (10YR 5.5/3 moist) to light brownish gray (10YR 6.5/2 dry) weak blocky, very friable silt loam.
1204	B32	31-41 inches. Pale brown (10YR 6/3 moist) to light gray (10YR 7/2 dry) very friable silt loam, on light side; weak vertical but no horizontal cleavage.
1205	C1	41-49 inches. Light brownish gray (10YR 6/2 moist) to light gray (10YR 7/2 dry) stratified very fine sandy loam and silt loam but over all of very fine sandy loam texture; firm in place but very friable when disturbed.
1206	C2ca	49-54 inches. Grayish brown (2.5Y 5/2 moist) to light gray (10YR 7/2 dry) silt loam with thin lenses of very fine sandy loam; numerous spots and seams of free lime carbonate; firm in place but friable when disturbed.
1207	C3	54-62 inches. About same as horizon next above except very fine sandy loam and less free lime.

Note: Stratified sandy and silty materials continue down to a nearly black buried soil at a depth of 6½ feet. The buried soil is silt loam in the upper part and silty clay or silty clay loam in lower part and about dark grayish brown color in the heavy layer at 10 feet, 4 inches, the lowest depth examined; no free lime in the darkest upper part of the buried soil but slightly calcareous below 9½ feet. This profile has weaker B horizon development and probably less clay in the B than S52Nebr-40-4. Both this profile and S52Nebr-40-4 are associated with the youngest soils on terrace alluvium and probably have less clayey B2 horizons than where associated with Wood River soils.

SOIL SURVEY LABORATORY Lincoln, Nebr. May 1959

SOIL TYPE Keith silt loam **LOCATION** Deuel County, Nebraska

SOIL NOS. S58Nebr-25-5-(1-7) **LAB. NOS.** 9417-9423

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	A1p	0.1	0.2	0.1	1.6	28.2	48.6	21.2	64.5	13.7	-	1

Soil type: Keith silt loam
Soil No.: S58Nebr-25-5-(1-7)
Location: 225 feet south and 135 feet east of west quarter corner Sec. 7, T14N, R41W; approximately 10 miles north of Big Springs, Deuel County, Nebraska.
Physiography: Loessial uplands.
Relief: 20 to 40 feet.
Clope: 1 to 2 percent smooth convex slope.
Aspect: South facing slope.
Parent material: Loess.
Drainage: Well drained.
Permeability: Moderate.
Salt or alkali: None.
Land use: Wheat 1958.
Climate: Average annual precipitation 18.5 inches; average annual temperature 49°F.
Collected by and date: John Elder, W. McKinzie, Robert Jordan, October 24, 1958.

Lincoln Lab. No.	Horizon	
9417	Alp	0-6", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
9418	B21	6-12", Brown (10YR 4/3 dry) to dark brown (10YR 3/3 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
9419	B22	12-16", Brown (10YR 4/3 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
9420	B3	16-24", Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry soft, moist very friable; noncalcareous; abrupt smooth boundary.
9421	Cca	24-34", Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; weak coarse prismatic; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
9422	C2	34-41", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
9423	C3	41-60", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence.

Worm activity throughout profile and very prominent in the B3 horizon.
Horizons Alp, B21 and Cca sampled for Bureau of Public Roads

SOIL SURVEY LABORATORY Lincoln, Nebr. May 1959

SOIL TYPE Keith silt loam LOCATION Deuel County, Nebraska

SOIL NOS. S58Nebr-25-6-(1-7) LAB. NOS. 9424-9430

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	A1p	0.1	0.2	0.1	2.1	31.9	46.1	19.5	67.5	12.3	-	1
6-11	B21	<0.1	0.1	0.1	1.9	30.8	44.3	22.8	64.2	12.5	-	1
11-19	B22	<0.1	0.1	0.1	1.7	28.5	44.7	24.9	60.2	14.5	-	1
19-23	B3	<0.1	0.1	0.1	1.9	29.7	46.8	21.4	62.5	15.7	-	1
23-35	Cca	<0.1	<0.1	<0.1	1.5a	32.7a	51.4	14.4	67.5	18.0	-	sil
35-46	C2	<0.1	0.1	0.1	1.7a	38.6a	45.8	13.7	72.2	13.7	-	1
46-60	C3	<0.1	<0.1	<0.1	1.4a	43.9a	43.6	11.1	77.6	11.2	-	1

Soil type: **Keith silt loam**
Soil No.: S58Nebr-25-6-(1-7)
Location: .15 mile south and 160 feet east of west quarter corner Sec. 2, T14N, R42W; approximately 10.5 miles north and 2 miles west of Big Springs, Deuel County, Nebraska.
Physiography: Loessial uplands.
Relief: 20 to 40 feet.
Slope: 1 to 2 percent convex.
Aspect: South facing slope.
Parent material: Loess.
Drainage: Well drained.
Permeability: Moderate.
Salt or alkali: None.
Land use: Wheat 1958.
Climate: Average annual precipitation 19.5 inches; average annual temperature 49°F.
Collected by and date: John Elder, Robert Jordan and W. McKinzie, Oct. 24, 1958.

Lincoln Lab. No.	Horizon	
9424	A1p	0-6", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
9425	B21	6-11", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse prismatic breaking to calcareous; clear smooth boundary.
9426	B22	11-19", Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
9427	B3	19-23", Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry soft, moist very friable; noncalcareous; abrupt wavy boundary.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/21/55

SOIL TYPE Keith silt loam **LOCATION** Hitchcock County, Nebraska

SOIL NOS. S54Nebr-44-2-(1-7) **LAB. NOS.** 2395-2401

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-5	A1p	-	0.1b	0.2	1.0	28.0	52.4	18.3	66.9	14.1	-	sil
5-9	A12	-	-	0.1b	0.3	20.2	55.4	24.0	60.3	15.5	-	sil
9-14	B21	-	-	0.1b	0.4	18.3	55.2	26.0	58.1	15.6	-	sil
14-23	B22	-	-	-	0.5	18.0	54.9	26.6	58.6	14.7	-	sil
23-33	Bca	-	0.1	0.2	1.1	22.1	50.4	26.1	57.6	15.4	-	sil
33-45	Cca	-	0.2b	0.3	1.1	27.7	53.4	17.3	61.0	20.7	-	sil
45-60	C	-	-	0.2b	0.9	30.7	53.3	14.9	66.1	18.4	-	sil

Soil type: Keith silt loam
Soil No.: S54Nebr-44-2-(1-7)
Location: .2 mile south and 110 feet east of northwest corner Sec. 13, T1N, R34W; 8 miles south and 5 miles west of Trenton, Hitchcock County, Nebraska.
Topography: Southeast facing slope of 1 to 2 percent gradient near the edge of a broad gently undulating remnant of a loess-mantled plain; the slope becomes steeper to the west.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2395	A_{1p}	0-5"	Dark grayish brown (10YR 4/1.5, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
2396	A_{12}	5-9"	Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure with vertical cleavage planes giving weak very coarse prisms; slightly hard, dry; friable, moist; clear smooth lower boundary.
2397	B_{21}	9-14"	Dark grayish brown (10YR 4.5/2, dry) to very dark grayish brown (10YR 3.5/2, moist) silty clay loam; compound moderate coarse and medium prismatic and weak coarse and medium blocky structure with better defined vertical than horizontal cleavage; slightly hard, dry; friable, moist; clear smooth lower boundary.
2398	B_{22}	14-23"	Grayish brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) silty clay loam; compound moderate medium and coarse prismatic and weak medium and fine blocky structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
2399	B_{ca}	23-33"	Light gray (10YR 7/2, dry) to pale brown (10YR 6/3, moist) heavy silt loam; weak subangular blocky structure with fairly well defined vertical cleavage; soft, dry; very friable, moist; calcareous; gradual lower boundary.
2400	C_{ca}	33-45"	Light gray (10YR 7/2.5, dry) to pale brown (10YR 6/3, moist silt loam; massive, but falls apart quite easily when

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/21/55

SOIL TYPE Keith silt loam **LOCATION** Hitchcock County, Nebraska

SOIL NOS. S54Nebr-44-3-(1-7) **LAB. NOS.** 2402-2408

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 1Alb: VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	0.1b	0.1b	0.2	0.9	24.3	53.9	20.5	62.2	16.5	-	sil
6-10	A12	-	-	0.1b	0.5	19.6	53.4	26.4	56.7	16.6	-	sil
10-13	B1	-	0.1	0.3	0.9	19.9	52.4	26.4	56.8	16.0	-	sil
13-20	B2	-	-	0.1	0.4	21.6	52.3	25.6	57.8	16.4	-	sil
20-30	Bca	-	0.1	0.3	1.3	21.5	52.1	24.7	56.6	17.8	-	sil
30-42	Cca	-	-	0.1	0.6	24.0	55.4	19.9	58.9	20.9	-	sil
42-60	C	-	0.3	0.3	1.2	28.1	53.9	16.2	63.4	19.3	-	sil

	pH		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC x 10³ MILLIMHOS PER CM	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.8	7.5	7.8	1.21	.104	11.6			-				9.8
6.9	7.8	7.9	0.82	.078	10.5			-				12.8
7.0	7.9	8.0	0.69	.071	9.7			-				12.6
7.1	8.1	8.2	0.57	.064	8.9			-				12.3
7.9	8.8	9.0	0.40	.052	7.7			3				12.7
8.1	9.1	9.3	0.29					8				11.9
8.1	9.1	9.3	0.15					6				10.0

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a 6H2b Ca	6G2b Mg	H	6P2a Na	6Q2a K	BASE SAT. % 5C1	Na	K	5A3a Sum Cations me/100g	8D5 Ca/Mg		MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →											
20.6	15.3	3.3		0.2	2.0	100			20.8	4.6		
20.5	16.9	3.9		0.2	1.6	100			22.6	4.3		
23.5	17.9	4.2		0.1	1.4	100			23.6	4.3		
23.4	17.5	4.6		0.1	1.4	100			23.6	3.8		
21.9				0.1	1.9							
20.6				0.2	2.7							
19.4				0.3	3.2							

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Keith silt loam
Soil No.: S54Nebr-44-3-(1-7)
Location: 225 feet east and 150 feet north of southwest corner Sec. 3, T1N, R33W; 7 miles south and 1 mile west of Trenton, Hitchcock County, Nebraska.
Topography: Southwest facing slope of 1 to 2 percent in an undulating landscape on a broad shallowly dissected loess-mantled interstream divide.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2402	A_{1p}	0-6"	Gray (10YR 4/1.5, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; weak fine granular; soft, dry; friable, moist; abrupt smooth boundary.
2403	A_{12}	6-10"	Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular; slightly hard, dry; friable, moist; some lighter-colored worm casts; smooth lower boundary.
2404	B_1	10-13"	Dark grayish brown (10YR 4.5/2, dry) to very dark grayish brown (10YR 3.5/2, moist) silty clay loam; fine subangular blocky structure but some vertical cracks result in coarse primary blocky breakage when this layer is carefully removed from place; slightly hard, dry; friable, moist; much worm activity; clear smooth lower boundary.
2405	B_2	13-20"	Grayish brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) silty clay loam; weak coarse prismatic separating to moderate medium and fine blocky structure; slightly hard, dry; friable, moist; much worm mixing of material from above horizons; clear smooth lower boundary.
2406	B_{ca}	20-30"	Light grayish brown (10YR 6/2.5, dry) to grayish brown (10YR 5/2.5, moist) heavy silt loam or silty clay loam; moderate fine and medium subangular blocky structure; slightly hard, dry; friable, moist; some dark worm casts from horizons above; white lime spots throughout and some disseminated lime in lower part; clear smooth lower boundary.
2407	C_{ca}	30-42"	Light gray (10YR 7.5/2, dry) to pale brown (10YR 6/3, moist) heavy silt loam; massive but crushes into subangular block-like firm lumps and loose soft material; friable when moist; slightly hard, dry; violent effervescence; both segregated and disseminated lime; clear smooth lower boundary.
2408	C	42-60"	Light gray (10YR 7/2.5, dry) to pale brown (10YR 5.5/3,

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

OIL TYPE Keith silt loam LOCATION Kimball County, Nebraska

SOIL NOS. S57Nebr-53-3-(1-9) LAB. NOS. 5810-5818

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1		2A2 > 2 (<19mm)	TEXTURAL CLASS
0-5	A1p	2.8a	8.0	5.1	7.1	20.4	38.2	18.4	49.3	13.0	Tr.	l
5-7	A12	1.8	5.1	3.7	5.2	20.3	42.5	21.4	51.0	15.0	1	l
7-10	B1	1.2	3.8	2.8	4.0	17.5	42.4	28.3	46.7	15.7	Tr.	cl
10-18	B21	0.4	2.0	1.6	2.9	17.3	45.6	30.2	48.0	16.8	Tr.	cl
18-23	B22	0.5	1.8	1.8	3.3	20.0	50.0	22.6	54.0	18.3	Tr.	sil/l
23-32	C1ca	0.8	2.8	1.9	3.3	22.3	50.9	18.0	57.0	18.4	Tr.	sil/l
32-40	C2	0.6	2.7	2.1	3.4	24.4	49.8	17.0	59.9	16.5	Tr.	l
40-57	C3	1.6	7.6	5.2	7.3	29.3	36.6	12.4	59.6	10.8	Tr.	l
57-64	C4	5.4	16.4	11.9	15.6	26.5	16.3	7.9	47.4	4.3	2	sl

	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		4B2
8C1b Saturated Paste	8C1a 1:1	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	ESTS. SALT (BUREAU CUP)	EC x 10³ MILLIMHOS PER CM 8A1a	$CaCO_3$ equivalent %	GYPSUM m.e./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
6.4	6.8	7.3	0.92	.076	12.1	<0.20	0.6	-				8.6
6.3	6.7	7.2	0.87	.080	10.9	<0.20	0.6	-				10.0
6.5	7.0	7.4	0.54	.058	9.3	<0.20	0.6	-				13.3
6.7	7.3	7.8	0.45	.049	9.2	<0.20	0.6	-				15.0
7.3	7.9	8.5	0.42	.051	8.2	<0.20	0.8	-				12.3
[illegible]							0.8	8				11.2

Soil type: Keith silt loam
Location: Kimball County, Nebraska. 0.25 mile south and 30 feet west of NE corner Sec. 16, T16N, R54W. About 9 miles north and 1 mile west of Dix, Nebraska.
Topography: Less than 1 percent slope in the gently undulating loess-covered plains.
Cultivated: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-3-(1-9)
Lincoln

Lab.No.	Horizon	
5810	Alp	0-5 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5811	A12	5-7 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary. This horizon appears to be a plow pan with very weak platy structure.
5812	B1	7-10 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) heavy silt loam; compound weak coarse subangular blocky and weak medium subangular blocky structure; friable, moist; clear smooth lower boundary; broken clay skins on vertical and horizontal faces.
5813	B21	10-18 inches. Light brownish gray (10YR 6/2 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins on both vertical and horizontal faces.
5814	B22	18-23 inches. Light grayish brown (10YR 6.5/2 dry) to dark brown (10YR 4.5/3 moist) light silty clay loam; compound weak coarse prismatic and moderate medium subangular blocky structure; firm, moist; abrupt smooth lower boundary; broken clay skins on vertical and horizontal faces.
5815	C1ca	23-32 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; disseminated lime present in root channels and on structural facing; gradual smooth lower boundary; several 1-2 inch Krotovinas present in this horizon.
5816	C2	32-40 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; weak coarse prismatic structure; very friable, moist; violent effervescence; clear smooth lower boundary.
5817	C3	40-57 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) very fine sandy loam; weak coarse prismatic to massive structure; very friable, moist; violent effervescence; abrupt smooth lower boundary; pockets of fine gravel present in this horizon.
5818	C4	57-64 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loamy sand; massive structure; loose; strong effervescence.

Note: Horizons Alp, B21 and C3 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Keith silt loam LOCATION Kimball County, Nebraska

SOIL NOS. S57Nebr-53-4-(1-9) LAB. NOS. 5819-5827

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			> 2	
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	(19mm)	

Soil type: Keith silt loam
Location: Kimball County, Nebraska. 0.4 mile north and 100 feet east (fence) of SW corner Sec. 18, T16N, R53W. About 8.5 miles north and 2 west of Dix, Nebraska.
Topography: Less than 1 percent slope in the gently undulating loess-covered plains.
Cultivated: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-4-(1-9).
Lincoln

Lab.No.	Horizon	
5819	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; [illegible]
5820	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary.
5821	B1	8-11 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) light silty clay loam; compound weak coarse subangular and weak medium subangular blocky structure; friable, moist; clear smooth lower boundary; broken clay skins on vertical and horizontal faces.
5822	B21	11-17 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins on vertical and horizontal faces.
5823	B22	17-23 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2.5 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; friable, moist; abrupt smooth lower boundary; broken clay skins on vertical faces; numerous worm casts present.
5824	C1ca	23-33 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; gradual smooth lower boundary; few worm casts present; disseminated lime present in root channels and on structural faces.
5825	C2	33-41 inches. Light gray (10YR 7/2 dry) to brown (10YR 5.5/3 moist) silt loam; weak coarse pris-

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/21/55

SOIL TYPE Kenesaw silt loam **LOCATION** Hall County, Nebraska

SOIL NOS. S54Nebr-40-1-(1-7) **LAB. NOS.** 2380-2386

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-7	A1p	-	1.8	1.4	2.5	23.0	52.4	18.8	62.5	14.5	-	sil
7-12	B21	0.3	1.3	1.0	1.7	18.1	49.0	28.6	53.1	15.0	-	cl
12-18	B22	-	-	0.3	0.5	15.8	52.6	30.8	49.9	18.8	-	sicl
18-32	B3	-	0.1b	-	0.3	17.3	58.1	24.2	54.2	21.4	-	sil
32-38	C1	-	0.1	-	0.5	22.1	59.1	18.2	60.3	21.2	-	sil
38-53	C2ca	-	-	0.1	0.5	23.6	60.4	15.4	62.5	21.8	-	sil
53-60	C3	-	0.1	0.1	0.5	18.7	64.7	15.9	59.9	23.8	-	sil

8C1b pH SATURATED PASTE	8C1a pH 1:5	8C1a pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
5.6	6.3	6.4	1.09	.106	10.3			-				9.1
5.9	6.7	6.7	0.82	.082	10.0			-				13.0
5.9	6.9	6.9	0.43	.056	7.7			-				14.2
6.3	7.2	7.2	0.23	.035				-				12.4
7.0	7.9	7.9	0.16					-				10.7
7.8	8.8	8.9	0.13					1				10.1
7.8	8.7	8.9	0.10					-				10.0

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6H2b Ca	6G2b Mg	H	6P2a Na	6Q2a K	BASE SAT. % 5C1	Na	K	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	milliequivalents per 100g. soil										
17.4	10.0	3.5		0.1	1.6	87			15.2	2.8	
23.6	14.6	5.2		0.1	1.2	89			21.1	2.8	
25.5	16.7	6.0		0.1	1.1	94			23.9	2.8	
23.5	16.4	5.1		0.1	1.4	98			23.0	3.2	
21.9	16.6	4.2		0.1	1.5	100			22.4	4.0	
21.1		4.5		0.2	1.8						
21.0		5.5		0.2	2.1						

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Kenesaw silt loam
Soil No.: S54Nebr-40-1-(1-7)
Location: 400 feet north and 80 feet east of west quarter corner Sec. 28, T9N, R10W; 4 miles west and 3-1/2 miles south of Doniphan, Hall County, Nebraska.
Topography: South facing 2 to 3 percent slope in gently undulating to undulating loess-mantled plain with indefinite or poorly developed surface drainage.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2380	A_{1p}	0-7"	Grayish brown (10YR 5/2, dry) to very dark grayish brown (10YR 3.5/2, moist) silt loam; weak fine granular structure soft, dry; friable, moist; abrupt lower boundary.
2381	B_{21}	7-12"	Grayish brown or brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) silty clay loam; moderate coarse prismatic structure separating to weak fine blocky or fine subangular blocky peds; hard, dry; firm, moist.
2382	B_{22}	12-18"	Light grayish brown (10YR 6/2, dry) to dark grayish brown (10YR 4/2.5, moist) silty clay loam; few faint fine yellowish brown and gray mottles in the lower part; compound moderate coarse prismatic and coarse blocky and weak fine blocky structure; hard, dry; friable, moist.
2383	B_3	18-32"	Pale brown (10YR 6/3, dry) to light olive brown (2.5Y 5/3 moist) light silty clay loam; compound weak coarse prismatic and weak coarse blocky; slightly hard, dry; friable, moist; gradual lower boundary.
2384	C_1	32-38"	Light gray (10YR 7/2, dry) to light brownish gray (10YR 6/2, moist) silt loam; massive or weak coarse blocky structure; slightly hard, dry; friable, moist; noncalcareous; clear wavy lower boundary.
2385	C_{2ca}	38-53"	Light gray (10YR 7/2, dry) to pale brown (10YR 6/2.5, moist silt loam; massive; soft, dry; friable, moist; strongly calcareous; some segregated but mainly disseminated lime.
2386	C_3	53-60"	Pale yellow (2.5Y 8/3, dry) light yellowish brown (2.5Y 6/3, moist) silt loam; massive; soft, dry; very friable, moist; calcareous.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/22/55

SOIL TYPE Kenesaw silt loam **LOCATION** Hamilton County, Nebraska

SOIL NOS. S54Nebr-41-1-(1-6) **LAB. NOS.** 2374-2379

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
		1B1b VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	
0-7	A1p	0.1b	0.1b	0.2	0.9	16.6	57.2	24.9	58.6	15.8	-	sil
7-15	B2	-	0.1	0.1	0.6	13.3	57.6	28.3	51.4	19.9	-	sicl
15-24	B3	-	-	0.1	0.3	13.9	61.0	24.7	53.9	21.2	-	sil
24-33	Bca	-	0.1	0.2	1.0	19.5	57.4	21.8	56.4	21.0	-	sil
33-48	Cca	-	0.1	0.2	0.5	14.3	64.3	20.6	55.1	23.8	-	sil
48-60	C	-	-	0.1	0.3	13.6	66.6	19.4	57.1	23.3	-	sil

	pH		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM	6E1a		MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)		$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.1	6.9	7.0	0.96	.093	10.3			-				10.6
6.6	7.5	7.6	0.35	.046	7.6			-				13.0
6.9	7.7	7.8	0.18	.028				-				12.0
7.5	8.5	8.7	0.15					-				11.7
7.8	8.7	8.9	0.12					1				11.3
7.8	8.6	8.8	0.08					2				11.0

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %			5A3a Sum Cations	8D3		MOISTURE AT SATURATION
	6H2b Ca	6G2b Mg	H	6P2a Na	6Q2a K	5C1	Na	K	me/100g.	Ca/Mg		%
	milliequivalents per 100g. soil											
20.3	12.7	4.7		0.1	1.6	94			19.1	2.7		
24.1	16.5	6.1		0.1	1.4	100			24.1	2.7		
25.0	16.4	5.5		0.2	1.5	94			23.6	3.0		
23.1	20.8	5.3		0.2	1.8	100			28.1	3.9		
22.4				0.2	2.1							
22.1				0.2	2.2							

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Kenesaw silt loam
Soil No.: S54Nebr-41-1-(1-6)
Location: 400 feet west and 130 feet south of northeast corner Sec. 7, T11N, R7W; 3 miles east and 3 miles north of Phillips, Hamilton County, Nebraska.
Topography: About 2 percent southeast facing slope in undulating loess-mantled plain.
Land use: Cultivated, wheat 1954.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2374	A_{1p}	0-7"	Grayish brown (10YR 5/2, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure; slightly hard, dry; friable, moist; under tillage breaks out in medium and coarse blocky clods after fields are dried out; abrupt smooth lower boundary.
2375	B_2	7-15"	Pale brown (10YR 6/3, dry) to grayish brown (10YR 4/2.5, moist) light silty clay loam; a few fine dark brown spots of accumulated iron segregation; compound moderate coarse prismatic and medium blocky structure; with vertical cleavage somewhat better defined; hard, dry; firm, moist; fairly numerous pores and root channels; gradual smooth lower boundary.
2376	B_3	15-24"	Very pale brown (10YR 7/3, dry) to pale brown (10YR 6/3, moist) heavy silt loam; common prominent yellowish brown and dark brown mottles; compound coarse prismatic and coarse blocky structure; hard, dry; friable, moist; numerous root channels, pores and a few worm burrows; clear wavy lower boundary. In places the noncalcareous material tongues 6 or more inches into the B_{ca} horizon along the major vertical cracking planes.
2377	B_{ca}	24-33"	Very pale brown (10YR 7.5/3, dry) to light yellowish inent fine yellow and brown mottles; compound weak coarse prismatic and very weak coarse blocky structure; slightly hard, dry; friable, moist; calcareous and strong effervescence mainly in spots and seams of lime carbonate accumulation; fairly numerous pores and root channels; clear smooth lower boundary.
2378	C_{ca}	33-48"	Very pale brown (10YR 8/3, dry) to pale brown (10YR 6/3, moist) silt loam; few faint fine pale yellow and light

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE *Keota silt loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-3-(1-6) **LAB. NOS.** 1953-1958

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1								2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-8	A1p	-	0.5	0.8	4.9	28.3	45.3	20.2	60.2	16.9	-	1
8-16	A12	0.9	1.9	2.2	9.0	25.3	45.9	14.8	56.2	21.1	-	1
16-24	C1	0.9	3.3	3.3	10.4	22.6	46.2	13.3	54.8	21.0	-	1
24-34	C2	0.9	2.4	2.2	8.1	22.6	52.8	11.0	58.6	22.4	-	sil
34-43	C3	0.6	2.9	3.8	11.6	21.6	49.0	10.5	55.3	22.7	-	1
43-60+	C4	0.4	2.1	2.8	10.7	29.7	44.5	9.8	61.8	19.5	-	1

	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		4B2
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC×10³ MILLIMHOS PER CM 8A1a	$CoCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
7.6	8.0	8.2	1.24			a	0.8	-				12.5
7.7	8.2	8.5	0.56				0.9	12				15.5
7.7	8.3	8.6	0.31				1.2	14				15.2
7.7	8.6	8.7	0.19				0.9	9	-			14.0
7.8	8.5	8.8	0.11				0.7	8	-			14.2
7.8	8.5	8.8	0.12				0.7	7	-			13.4

5A1a	5B1a CATIONS			5B1b	5D2	8A1 SATURATION EXTRACT SOLUBLE		8A
CATION EXCHANGE CAPACITY NH_4OAc	EXTRACTABLE 6O2b Ca	6O2b Mg	EXCHANGEABLE 6P2a Na	6Q2a K	EXCH. Na %	6P1a Na	6Q1a K	MOISTURE AT SATURATION %
	← milliequivalents per 100g. soil →					← milliequivalents per liter →		
25.9		3.9	0.5	2.1	2	1.7	0.8	51.3
26.9		3.6	0.3	1.7	1	2.9	0.4	53.9
27.1		4.3	0.6	2.0	2	3.5	0.6	51.7
26.5		5.0	0.4	3.0	2	3.2	0.8	49.0
25.5		6.0	0.4	3.6	2	2.9	1.0	48.0
24.6		5.8	0.3	3.8	1	2.3	1.0	46.1

a. Less than 0.20%

Soil type: *Keota silt loam
Soil No.: S53Nebr-79-3-(1-6)
Date Sampled: September 30, 1953
Location: Four hundred feet west and 1375 feet south of NE corner Sec. 16, T22N R56W, Scotts Bluff County, Nebraska.
Topographic position: Foot slope.
Relief: Slight, smooth 4-5 percent slope, northeast facing.
Drainage: Well drained.
Ground water: Many feet to water level.
Root distribution: Normal throughout. No evidence of limiting horizons.
Land use: Irrigated from ditch--beans 1953. Harvested prior to sampling. Farmer reports 50 bushel yield. 1953 first crop after alfalfa. Described by: John Elder.

Mandan Lab.No.	Horizon	
1953	Alp	0-8 inches. Grayish brown (10YR 5.5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam. Weak medium subangular blocky to very fine, very weak granular, slightly hard dry, friable moist, slight effervescence, grades abruptly and smoothly.
1954	A12	8-16 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to very weak fine granular, slightly hard dry, friable moist, violent effervescence, no coatings on aggregates, gradual, smooth boundary.
1955	C1	16-24 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) loam. Very weak coarse subangular blocky to very weak fine granular, soft dry, very friable moist, contains a few slightly hard pieces (1/8-1/4 inch) of Brule fragments, violent effervescence; diffuse, smooth boundary.
1956	C2	24-34 inches. Pinkish white (7.5YR 8/2 dry) to pink (7.5YR 7/4 moist) silt loam. Massive to single grain with many medium to small soft lumps and powdery material after crushing, soft dry, very friable moist, violent effervescence; diffuse, smooth boundary.
1957	C3	34-43 inches. Pinkish white (7.5YR 8/2 dry) to pink (7.5YR 7/4 moist) silt loam. Massive to single grain with many medium and small soft lumps and powdery material after crushing, soft dry, very friable moist, violent effervescence; diffuse, smooth boundary.
1958	C4	43-60 inches. Pinkish white (7.5YR 8/2 dry) to pink (7.5YR 7/4 moist) very fine sandy loam. Massive breaking to single grain, soft dry, very friable moist, violent effervescence, continuing below 60 inches to an undetermined depth.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE *Keota silt loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-5-(1-8) **LAB. NOS.** 1965-1972

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p1	-	0.6	1.5	5.8	34.3	37.4	20.4	59.8	15.9	-	l
6-9	A1p2	-	0.5	1.1	6.0	27.1	51.5	13.8	56.0	26.7	-	sil
9-15	A12	-	0.5	1.4	5.6	32.0	40.0	20.5	57.9	17.9	-	l
15-29	C1	-	1.2	2.1	6.8	25.2	51.0	13.7	55.9	24.7	-	sil
29-38	C2	-	1.3	1.4	4.8	22.3	57.6	12.6	56.9	26.2	-	sil
38-44	C3	0.7	2.0	1.9	5.7	17.6	58.8	13.3	51.0	29.0	-	sil
44-51	C4	0.2	1.0	1.2	4.7	22.0	59.7	11.2	58.1	26.8	-	sil
51-60	C5	0.2	0.6	0.9	4.3	22.7	60.4	10.9	58.8	27.1	-	sil

pH 8C1b SATURATED PASTE	pH 8C1a 1:5	pH 8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	ORGANIC MATTER NITROGEN %	ORGANIC MATTER C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	MOISTURE TENSIONS 1/3 ATMOS. %	1/4B2 15 ATMOS. %
7.7	8.2	8.5	1.19			a	1.0	-				12.6
7.8	8.2	8.4	0.99				1.3	-				12.8
7.6	8.3	8.5	0.63				2.0	8				15.2
7.7	8.4	8.6	0.34				2.4	11	-			13.7
7.8	8.8	9.0	0.13				2.2	9	-			13.5
7.9	9.2	9.3	0.10				1.9	15	-			14.4
8.0	9.4	9.5	0.09				1.6	9	-			13.0
8.1	9.3	9.6	0.06				1.6	8	-			13.0

Soil type: *Keota silt loam
Soil No.: S53Nebr-79-5-(1-8)
Date sampled: October 1, 1953
Location: 0.4 miles south and 0.7 miles east of NW corner Sec. 22, T22N R57W, Scotts Bluff County, Nebraska.
Topographic position: Foot slope. Described by: John Elder.
Relief: Slight, smooth 3 percent slope, southwest facing.
Drainage: Well drained. Sample site is about 100 feet below irrigation ditch (not a large supply canal).
Ground water: Many feet to water level.
Root distribution: Normal throughout. No evidence of limiting horizon.
Land use: Irrigated from ditch--beans 1953. Crop harvested but no yield available.

Mandan Lab.No.	Horizon	
1965	Alp1	0-6 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam. Weak medium subangular blocky to very weak very fine granular, hard dry, friable moist, few fine white lime spots, matrix noncalcareous; abrupt, smooth boundary.
1966	Alp2	6-9 inches. Variegated color. Pale brown and grayish brown (10YR 6/3-5/2 dry) to grayish brown and dark grayish brown (10YR 5/2 and 4/2 moist) silty clay loam. Moderate coarse subangular blocky to moderate fine granular, hard dry, friable moist, darker material noncalcareous, lighter material violent effervescence, abrupt smooth boundary.
1967	A12	9-15 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to weak fine granular, slightly hard dry, friable moist, a few worm openings and worm casts, violent effervescence, gradual, smooth boundary.
1968	C1	15-29 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to very weak fine and very fine granular, soft dry, very friable moist, violent effervescence, many fine white lime spots, grades gradually and smoothly.
1969	C2	29-38 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Very weak coarse subangular blocky to very weak fine and very fine granular, soft dry, very friable moist, violent effervescence, few fine white lime spots in pores and openings, a few slightly hard Brule fragments are present. Abrupt, irregular boundary.
1970	C3	38-44 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam, very weak medium and coarse subangular blocky to moderate fine granular, soft dry, very friable moist, few fine white lime specks in pores and openings, many slightly hard Brule fragments and an occasional quartz pebble; this is probably an old surface; clear, wavy boundary.
1971	C4	44-51 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Very weak coarse subangular blocky to moderate fine granular, soft dry, very friable moist, violent effervescence, thin lime coating on sides of some pore and root openings, a few hard Brule fragments. Diffuse, wavy boundary.
1972	C5	51-60 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Massive or very weak coarse subangular blocky with tendency to break to weak fine granules as well as single grain, soft dry, very friable moist, violent effervescence, continues downward to undetermined depth.

Note: Pink Brule chips (7.5YR 7/4 moist) are present in the lower horizons (29 inches plus) giving the vialed samples a faint pinkish cast. In profile S53Nebr-79-3, Keota silt loam, the corresponding horizons have colors which best match the 7.5YR chart.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Lamoure silty clay loam **LOCATION** Dodge County, Nebraska

SOIL NOS. S53Nebr-27-3-(1-8) **LAB. NOS.** 1518-1525

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 <19mm	TEXTURAL CLASS
0-6	A1p	-	0.5	1.3	5.1	21.1	51.0	21.0	61.2	14.5	-	sil
6-18	A12	0.4	1.9	4.0	13.3	14.3	42.7	23.4	50.2	15.2	-	l
18-25	AC	1.4	1.9	3.6	14.4	10.6	37.4	30.7	42.4	14.8	-	cl
25-33	C1	1.1	1.6	2.6	14.3	11.1	37.5	31.8	44.0	13.9	Tr.	cl
33-40	C2	1.4	1.6	2.6	15.2	13.4	38.4	27.4	50.4	11.5	1	cl
40-44	C3	1.8	1.5	2.4	14.5	14.0	42.4	23.4	54.5	11.4	2	l
44-48	Ccag	2.0	1.4	2.0	13.1	11.7	47.6	22.2	53.2	14.3	Tr.	l
48-57	Cg	-	0.7	2.8	31.9	9.8	43.5	11.3	63.4	8.1	-	l

pH 8C1b SATURATED PASTE	pH 8C1a 1:5	pH 8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	ORGANIC MATTER NITROGEN %	ORGANIC MATTER C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CoCO_3$ equivalent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	MOISTURE TENSIONS 1/3 ATMOS. %	4B2 15 ATMOS.
6.6	7.0	7.0	1.27			a	4.6	-				10.7
7.9	8.3	8.4	0.59				1.8	1				11.6
8.2	6.5	8.6	0.38				1.4	3				14.9
8.2	8.6	8.6	0.29				1.2	2	-			15.8
8.2	8.5	8.5	0.22				1.1	1	-			14.1
8.1	8.3	8.5	0.17				1.1	2	-			15.3
8.3	8.6	8.6	0.16				1.0	17	-			9.8
7.9	8.0	8.2	0.05				1.0	-	-			6.4

5A1a CATION EXCHANGE CAPACITY NH_4Ac	5B1a CATIONS EXTRACTABLE 6N2b Ca	5B1a CATIONS EXTRACTABLE 6O2b Mg	5B1b EXCHANGEABLE 6P2a Na	5B1b EXCHANGEABLE 6Q2a K	5I2 EXCH. Na %	8A1 SATURATION EXTRACT SOL. 6P1a Na	8A1 SATURATION EXTRACT SOL. 6Q1a K	Ca/Mg	8A MOISTURE AT SATURATION %
← milliequivalents per 100g. soil →						← milliequivalents per liter →			
21.2	13.1	7.2	0.4	0.8	2	4.1	0.5		45.4
20.5	14.5	9.7	1.3	0.3	6	10.6	0.1		48.5
24.4			2.2	0.5	9	10.2	-		62.9
23.6			2.2	0.5	9	9.3	0.1		67.5
20.6			1.9	0.5	9	7.6	0.1		64.3
17.9			1.6	0.6	9	7.0	0.1		55.4
12.8			1.1	0.4	8	5.9	0.1		45.8
10.4	6.3	3.7	0.9	0.4	9	5.6	0.1		34.9

a. Less than 0.20%.

Soil type: Lamoure silty clay loam
Soil No.: 853Nebr-27-3-(1-8)
Location: One hundred feet east of center of Sec. 8, T17N, R7E, Dodge County, Nebraska.
Topographic position: Platte River bottom land, slack-water sediment area some distance from river on flat to slightly depressed position, with possible flooding from upland drains.
Relief: Flat, no surface drainage except that provided by road ditches.
Drainage: Surface drainage lacking, profile poorly drained.
Ground water: Water table about 57 inches at time of sampling.
Land use: Cultivated.
Described by: B. H. Williams and Donald C. Yost.
Mandan
Lab.No. Horizon
1518 A1p 0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam; coarse

[redacted]

friable, moist; noncalcareous; abrupt smooth lower boundary.

1519 A12 6-18 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam; weak coarse subangular blocky separating to strong medium and fine granular; slightly hard, dry; slightly plastic, wet; matrix noncalcareous but with many fine, soft, white, lime concretions in larger pores and openings; clear smooth lower boundary.

1520 AC 18-25 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silty clay; few faint brown mottles and stains; moderate coarse prismatic separating easily to strong fine blocky; hard, dry; plastic, wet; weak effervescence, lime is in faint coating on pore opening with a few fine, white concretions; clear smooth lower boundary.

1521 C1 25-33 inches. Gray (10YR 5/1 dry) to dark gray (10YR 4/1 moist) silty clay; few distinct fine brown mottles; moderate coarse prismatic breaking to strong medium blocky; firm, moist; hard, dry; plastic, wet; very weak effervescence, a few hard lime concretions up to 1/2 inch in diameter; clear smooth lower boundary.

1522 C2 33-40 inches. Gray (10YR 5/1 dry) to dark gray (10YR 4/1 moist) silty clay loam; common distinct fine to coarse brown mottles and stains; moderate medium prismatic breaking to strong medium blocky; hard, dry; firm, moist; plastic, wet; weak effervescence, few hard lime concretions; clear smooth lower boundary.

1523 C3 40-44 inches. Grayish brown (2.5Y 5.5/2 dry) to dark grayish brown (2.5Y 4/2 moist) silty clay loam; many distinct fine and coarse brown mottles; weak medium blocky separating to moderate fine granular; hard, dry; firm, moist; plastic, wet; weak effervescence, many hard lime concretions, clear smooth lower boundary.

1524 Ccag 44-48 inches. White (10YR 8/1 dry) to light brownish gray (10YR 6/2 moist) silty clay loam; many distinct brown mottles and soft brown concretions; weak fine granular; violent effervescence; clear smooth lower boundary.

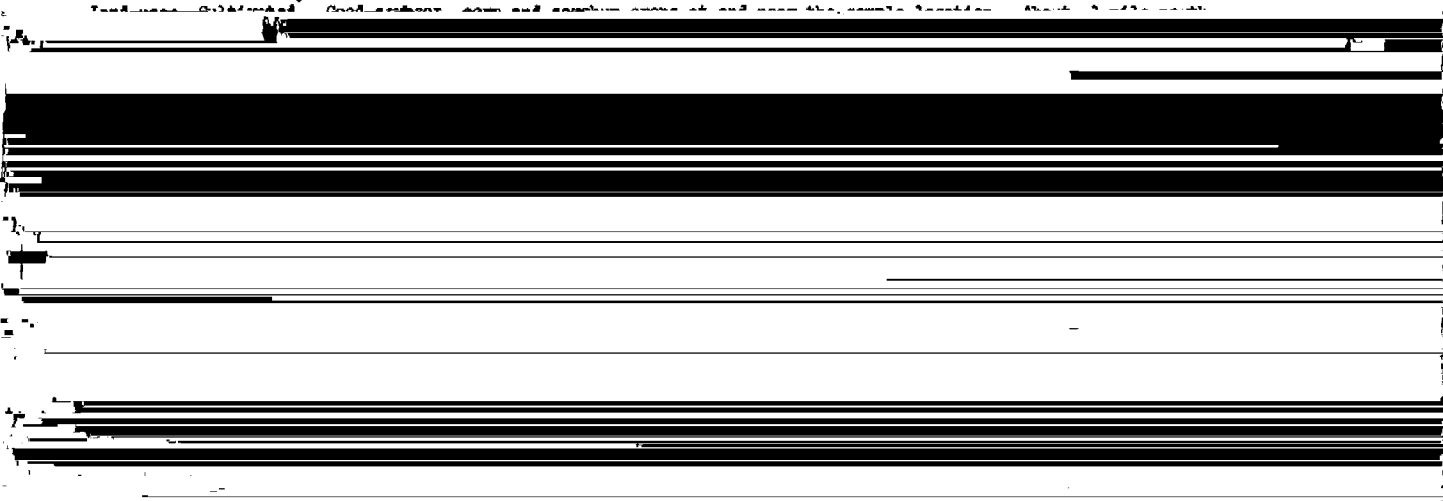
SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Leshara silt loam **LOCATION** Dodge County, Nebraska

SOIL NOS. S53Nebr-27-4-(1-8) **LAB. NOS.** 1526-1533

		1B1a			PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1						2A2	
DEPTH INCHES	HORIZON	VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	TEXTURAL CLASS
0-6	Alp	0.1	0.3	0.8	8.2	14.4	59.0	17.2	64.2	15.6	-	sil
6-16	A12	-	0.6	1.3	7.2	11.1	54.8	25.0	51.2	20.1	-	sil
16-23	AC	-	0.7	1.9	10.8	12.9	48.3	25.4	50.8	18.5	-	l
23-30	Cca	0.2	1.3	3.4	20.3	17.9	36.8	20.1	56.5	13.4	-	l
30-36	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Soil type: Leshara silt loam
Soil No.: S53Nebr-27-4-(1-8)
Location: 0.2 mile south of NW corner Sec. 11, T17N, R6E, Dodge County, Nebraska.
Topographic position: Flat to slightly depressed Platte River bottom land position. Above flood level of the River.
Relief: Slight.
Drainage: Imperfectly or poorly drained. Surface drainage is lacking except as provided by road ditches and a deep drainage ditch about 1 mile northeast of the sample site. The soil shows decided dull color throughout, typical of soils developed under poor drainage. The soil, however, seems moderately permeable above the fine textured material at 70 inches.
Ground water: Saturated below 54 inches but this water may be held above the fine textured material at 70 inches and may not indicate the static water level.



of the sample site crops are uneven in growth and show evidence of saline or alkali conditions.
Described by: B. H. Williams and Donald C. Yost.
Mandan

Lab.No.	Horizon	
1526	A1p	0-6 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) heavy silt loam; moderate fine and very fine granular; slightly hard, dry; friable, moist; noncalcareous pH 7.0 (Soiltex); abrupt smooth lower boundary.
1527	A12	6-16 inches. Dark gray (10YR 4/1 dry) to black (10YR 2/1 moist) silty clay loam; weak subangular blocky separating to strong medium and fine granular; hard, dry; friable, moist; numerous medium and fine pores; slightly plastic, wet; noncalcareous or calcareous only in spots; pH 7.5; clear smooth lower boundary.
1528	AC	16-23 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam with gray (10YR 6/1 dry) coatings on the smaller aggregates; massive or weak medium subangular blocky separating to moderate fine and very fine blocky; hard, dry; friable, moist; plastic, wet; numerous lighter colored worm casts from horizon below; violent effervescence, pH 8.5; clear smooth lower boundary.
1529	Cca	23-30 inches. Gray (10YR 6/1 dry) to dark gray (10YR 4.5/1 moist) silty clay loam; moderate medium subangular blocky breaking to moderate fine and very fine blocky; slightly hard, dry; friable, moist; violent effervescence, pH 9.0; root openings and pores are coated or filled with white lime resulting in numerous tubular and rounded soft lime segregations; clear smooth lower boundary.
1530	C2	30-36 inches. Gray (10YR 5.5/1 dry) to dark gray (10YR 4.5/1 moist) loam; few faint fine brown mottles; moderate medium subangular blocky breaking to moderate fine and very fine subangular blocky; slightly hard, dry; friable, moist; violent effervescence, pH 9+; clear smooth lower boundary.
1531	C3	36-45 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4.5/2 moist) fine sandy loam; many coarse distinct brown mottles; massive; slightly hard, dry; very friable, moist; weak effervescence; clear smooth lower boundary.
1532	G1	45-54 inches. Light gray (10YR 7.5/1 dry) to light brownish gray (10YR 6/2 moist) loamy fine sand; many medium and coarse prominent brown mottles, few medium prominent black soft iron concretions; loose, dry; loose, moist; massive; moderately compact in place, breaks to rounded lumps of varying size; noncalcareous; clear smooth lower boundary.
1533	G2	54-60 inches. Light gray (10YR 7/1.5 dry) to light brownish gray (2.5Y 6/2 moist) loamy fine sand; few faint fine yellowish brown mottles; massive; slightly hard, dry; loose, moist; noncalcareous; saturated. This horizon continues to about 70 inches where it rests on gray plastic silty clay.

Note: The subsoil is a little on the heavy side for Leshara. It is about like Lamoure in subsoil texture to a depth of 30 inches. Below this depth, however, the texture is too coarse for Lamoure.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Leshara silt loam **LOCATION** Hall County, Nebraska

SOIL NOS. S53Nebr-40-4-(1-7) **LAB. NOS.** 1571-1577

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	0.3	0.8	1.1	5.5	12.7	58.0	21.6	58.2	16.2	-	sil
6-10	A12	0.1	0.7	1.0	4.5	11.4	59.4	22.9	56.9	16.9	-	sil
10-15	AC	-	0.2	0.3	0.8	14.0	65.8	18.9	64.5	15.8	-	sil
15-24	C1	0.1	0.1	0.1	0.2	16.3	69.4	13.8	74.9	10.9	-	sil
24-29	A1b	0.5	0.3	0.1	0.5	1.1	57.6	39.9	20.4	38.6	-	sicl
29-36	C1b	0.1	0.1	0.2	5.0	37.9	44.8	11.9	80.6	6.5	-	l
36-48	C2b	-	0.7	1.7	23.0	34.9	25.9	13.8	72.8	6.6	-	vfsl

Soil type: Leshara silt loam
Soil No.: S53Nebr-40-4-(1-8)
Location: 0.3 mile south of NE corner Sec. 2, T10N, R10W, Hall County, Nebraska.
Topographic position: Platte River bottom land, slightly lower than the alluvial to the north, farther from river.
Relief: Slight.
Drainage: Imperfectly drained.
Ground water: Water table at 48 inches in July. Probably fluctuates between 3 and 6 feet during the growing season.
Land use: Cultivated.
Described by: B. H. Williams and Donald C. Yost.

Mandan Lab.No.	Horizon	
1571	A1p	0-6 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate fine and very fine granular; slightly hard, dry; friable, moist; strong effervescence, abrupt smooth lower boundary.
1572	A12	6-10 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate medium and fine granular; slightly hard, dry; friable, moist; violent effervescence; numerous very fine and a few large pores and root channels; clear smooth lower boundary.
1573	AC	10-15 inches. A horizon of intense earthworm action resulting in about equal proportions of gray and dark gray (10YR 5/1 and 4/1 dry) to dark gray and very dark gray (10YR 4/1 and 3/1 moist) silt loam; moderate fine and very fine granular; slightly hard, dry; friable, moist; violent effervescence; clear smooth lower boundary.
1574	C1	15-24 inches. Light gray (2.5Y 7/2 dry) to light brownish gray (2.5Y 6/2 moist) silt loam; moderate medium and fine crumb; slightly hard, dry; friable, moist; strong effervescence; streaks and spots; clear smooth lower boundary.
1575	A1b	24-29 inches. Gray (10YR 5.5/1 dry) to dark gray (10YR 4/1.5 moist) silty clay loam; few faint fine brown mottles; weak subangular blocky breaking to moderate fine and very fine subangular blocky; hard, dry; friable, moist; slightly plastic, wet; noncalcareous except for worm casts; clear smooth lower boundary.
1576	C1b	29-36 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) very fine sandy loam or loam; many distinct coarse brown and yellow mottles and stains and a few coarse dark brown soft concretionary iron spots; massive, breaking to rounded lumps; soft, dry; very friable, moist; noncalcareous; clear smooth lower boundary.
1577	C2b	36-48 inches. Similar to horizon above with many prominent coarse brown mottles including concentric staining around root channels that is very dark brown along the opening and grades outward to pale brown or yellowish brown; saturated; noncalcareous; roots from nearby cottonwood trees penetrate to the coarse material below; abrupt lower boundary.
	D	48+ inches. Not sampled for Mandan laboratory. Light gray (10YR 7/2 dry) coarse clean sand and fine gravel. Water table in this layer and in contact with the silty material above when sampled in June 1953.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Leshara silt loam LOCATION Merrick County, Nebraska

SOIL NOS. S53Nebr-61-1-(1-5) LAB. NOS. 1544-1548

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-8	A1p	0.1	0.6	1.4	8.1	20.2	50.6	19.0	64.0	13.0	-	sil
8-14	AC	-	0.4	0.7	9.8	16.6	51.9	20.6	64.8	12.4	-	sil
14-22	A11b	0.2	2.9	4.8	10.0	13.1	37.5	31.5	40.8	15.6	-	cl
22-32	A12b	0.8	7.0	8.8	15.8	13.8	26.1	27.7	39.1	8.8	-	scl
32-39	D	2.0	0.4	21.9	21.0	13.5	26.0	15.2	41.9	7.7	Tr.	fsl

DEPTH INCHES	pH 8C1b SATURATED PASTE	pH 8C1a 1:5	pH 8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	ORGANIC MATTER NITROGEN %	ORGANIC MATTER C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	MOISTURE TENSIONS 1/3 ATMOS. %	4B2 15 ATMOS. %
0-8	7.4	7.8	7.9	1.97			a	1.3	1				10.3
8-14	8.0	8.4	8.6	1.12				0.6	4				10.8
14-22	8.1	8.3	8.6	1.52				0.7	9				15.6
22-32	8.1	8.4	8.6	0.80				1.2	10	-			11.9
32-39	7.9	8.3	8.3	0.18				1.9	1	-			7.3

DEPTH INCHES	5A1a CATION EXCHANGE CAPACITY NH_4Ac	5B1a CATIONS EXTRACTABLE Ca	6O2b Mg	5B1b EXCHANGEABLE 6P2a Na	6Q2a K	5D2 EXCH. Na %	8A1 SATURATION EXTRACT SOL. 6P1a Na	6Q1a K	8A MOISTURE AT SATURATION %
	←	milliequivalents per 100g. soil	→				← milliequivalents per liter →		
0-8	22.7		5.0	0.4	1.7	2	0.4	1.5	47.6
8-14	17.8		6.2	0.6	1.1	3	0.6	0.5	51.9
14-22	21.5			0.7	0.8	3	1.7	0.4	59.1
22-32	15.1			1.1	0.6	7	4.8	0.4	52.5
32-39	11.8		5.3	1.0	0.5	8	9.3	0.4	39.0

a. Less than 0.20%.

Soil type: Leshara silt loam
Soil No.: S53Nebr-61-1-(1-5)
Location: 0.15 mile south of NE corner Sec. 2, T12N, R7W, Merrick County, Nebraska.
Topographic position: Platte River bottom land above flood level.
Relief: Slight
Drainage: Imperfectly or poorly drained.
Ground water: Three and one-half to 6 feet below the surface depending on the season.
Land use: Cultivated.
Described by: B. H. Williams and Donald C. Yost.
Mandan

Lab.No.	Horizon	
1544	Alp	0-8 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate fine and very fine granular; soft, dry; friable, moist; very weak effervescence, pH 7.5 (Soiltex); clear smooth lower boundary.
1545	AC	8-14 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; weak medium sub-

[redacted]

moist; strong effervescence, pH 8.0; clear smooth lower boundary.

1546	A11b	14-22 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam, with some slightly lighter colored worm casts; weak fine subangular blocky separating to strong fine and very fine granular; slightly hard, dry; slightly plastic, wet; violent effervescence; clear smooth lower boundary.
1547	A12b	22-32 inches. Gray (10YR 5/1 dry) very dark gray(10YR 3/1 moist) silty clay loam; moderate fine subangular blocky separating to strong medium and fine granular; slightly hard, dry; plastic, wet; violent effervescence; clear smooth lower boundary.
1548	D1	32-39 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) sandy loam; common coarse prominent brown mottles and stains common; weak medium and fine granular; very weak effervescence in spots; abrupt smooth lower boundary.
	D2	39+ inches. Coarse sand with some fine gravel, not sampled.

Note: This profile is on the heavy side, in third and fourth horizons, for Leshara but probably is best classed with this series rather than the Lamoure soils, which is the only alternative series at present. In the general area of this location, at least part of the soils are silty throughout. They are moderately permeable but drainage is restricted by the high water table (3½ to 6 feet, depending on the season). Occasional slick or "alkali" spots occur in these soils in the general area where sampled.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Leshara silt loam LOCATION Saunders County, Nebraska

SOIL NOS. 853Nebr-78-3-(1-8) LAB. NOS. 1490-1497

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	-	-	-	0.5	18.1	64.4	17.0	68.4	14.4	-	sil
6-10	A12	-	-	-	0.2	17.1	63.2	19.5	65.3	15.2	-	sil
10-13	AC	-	-	-	0.2	18.4	64.2	17.2	70.0	12.8	-	sil
13-19	C1	-	-	0.2	1.0	27.5	60.4	10.9	77.0	11.6	-	sil
19-26	C2	-	-	0.1	0.3	22.7	67.6	9.3	77.1	13.4	-	sil
26-32	Cca	0.2	0.3	0.1	0.2	4.5	78.2	16.5	45.1	37.7	-	sil
32-46	C3	-	-	0.1	0.6	27.5	65.6	6.2	84.6	8.9	-	sil
46-52	Cg or G	0.1	0.1	0.1	0.9	4.6	48.4	45.8	25.8	28.0	-	sic

	pH		ORGANIC MATTER			8A2	ELECTRICAL	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON	NITROGEN	C/N	EST% SALT (BUREAU CUP)	CONDUCTIVITY EC×10³ MILLIMHOS PER CM	$CaCO_3$ equivalent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.

Soil type: Leshara silt loam
Soil No.: S53Nebr-78-3-(1-8)
Location: Five hundred feet south of north 1/4 corner Sec. 25, T13N, R9E, Saunders County, Nebraska.
Topographic position: Platte River bottomland above flood level of the river but may be occasionally flooded by local runoff.
Relief: Slight, sample site in broad slight swale.
Drainage: Imperfectly drained.
Ground water: Probably the water table about 5 feet. Probably rises to within 3½ feet of the surface during wet seasons.
Land use: Cultivated. Crop growth uneven due to presence of "slick spots" and possibly free salts.
Described by: B. H. Williams and Donald C. Yost.

Mandan

Lab. No.	Horizon	
1490	Alp	0-6 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; noncalcareous, pH 7.2; abrupt smooth lower boundary.
1491	A12	6-10 inches. Gray (10YR 5/1.5 dry) to very dark grayish brown (10YR 3/2 moist) silt loam with moist; noncalcareous, pH 7.0; clear smooth lower boundary.
1492	AC	10-13 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam with some darker colored worm casts; moderate medium and fine granular; slightly hard, dry; friable, moist; noncalcareous, pH 7.0; clear smooth lower boundary.
1493	C1	13-19 inches. Light brownish gray (10YR 6.5/2 dry) to grayish brown (10YR 5/2 moist) silt loam; many prominent fine brown mottles and stains; moderate medium and fine granular; soft, dry; friable, moist; many fine and medium pores and root openings; calcareous, pH 7.0; clear smooth lower boundary.
1494	C2	19-26 inches. Light gray (2.5Y 7/2 dry) to grayish brown (2.5Y 5/2 moist) silt loam; common distinct fine brown mottles; massive or very weak coarse subangular blocky; soft, dry; very friable, moist; noncalcareous, or calcareous only in spots, pH 7.5 (Soiltex); clear smooth lower boundary.
1495	Cca	26-32 inches. Light brownish gray (2.5Y 6/2 dry) to dark gray (2.5Y 4/1 moist) silt loam, stratified with thin lenses of lighter colored silt loam or very fine sandy loam; weak fine granular; soft, dry; friable, moist; violent effervescence, pH 9.0; many white lime spots and small soft concretions; clear smooth lower boundary.
1496	C3	32-46 inches. Light gray (2.5Y 7.5/2 dry) to light brownish gray (2.5Y 6/2 moist) very fine sandy

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Luton silty clay LOCATION Washington County, Nebraska

SOIL NOS. S57Nebr-89-1-(1-8) LAB. NOS. 6255-6262

	1B1a	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1						2A2	
	very				very				

Soil type: Luton silty clay
Soil No.: S57Nebr-89-1-(1-8)
Location: 175 feet west and 80 feet north of southeast corner of northeast quarter Sec. 28, T20N, R11E, Washington County, Nebraska.
Physiography: Nearly level Missouri River flood plain, infrequently flooded.
Relief: 1 to 3 feet.
Slope: Smooth level, less than 0.5 percent.
Parent material: Alluvial clays.
Drainage: Poor; surface drainage has been improved by drainage ditches.
Permeability: Very slow.
Salt or alkali: Some $CaSO_4$; much $CaCO_3$ in Ca horizons; a few shell fragments in calcareous horizons.
Land use: Cultivated, wheat 1957. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number	
A1p 6255	0 to 6 inches. Black (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) silty clay. Strong fine and medium granular structure; firm, moist; plastic, wet; noncalcareous. Lower 2 inches of horizon is browner (2.5Y 3/2 moist) than the upper 4 inches of the horizon; abrupt smooth boundary.
A1b 6256	6 to 12 inches. Black (10YR 2/1 moist) to very dark gray (2.5Y 3/0 dry) silty clay. Moderate fine blocky breaking to strong fine granular structure; firm, moist; hard, dry; noncalcareous; becomes slightly lighter in color in lower part of horizon; abrupt clear boundary.
Ccab 6257	12 to 16 inches. Very dark gray (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) silty clay. Firm, moist; hard, dry; moderate medium blocky breaking to moderate fine and very fine angular blocks; few faint fine light yellowish brown mottles; weak effervescence; numerous large and small $CaCO_3$ segregations; abrupt clear boundary.
A1b2 6258	16 to 24 inches. Black (10YR 2/1 moist) to black (2.5Y 2/0 dry) silty clay; weak medium blocky breaking to fine and very fine angular blocky; firm, moist; hard, dry; matrix noncalcareous; a few fine segregations of $CaCO_3$. Gradual smooth boundary.
A12b2 6259	24 to 33 inches. Black (10YR 2/1 moist) to very dark gray (2.5Y 3/0 dry) clay; moderate medium and and coarse prismatic breaking to strong fine angular blocky; very firm, moist; very hard, dry; roots are abundant in this horizon but are confined to the faces of the aggregates; few roots go through this horizon; very compact; slickensides present in lower one-third of horizon; matrix noncalcareous; numerous fine and medium $CaCO_3$ segregations and nests of gypsum crystals common; clear smooth boundary.
A13b2 6260	33 to 43 inches. Black (10YR 2/1 moist) to very dark gray (2.5Y 3/0 dry) clay, grading to 2.5Y 3/2 moist in lower part; strong gleying; moderate coarse prismatic breaking to strong medium blocky; very firm, moist; very hard, dry; very compact; slickensides present; noncalcareous; a few nests of gypsum crystals present; clear smooth boundary.
C1b2 6261	43 to 50 inches. Very dark grayish brown (2.5Y 3/2 moist) to dark gray (2.5Y 4/1 dry) silty clay with common medium yellowish brown mottles; strong gleying; moderate medium prismatic breaking to strong medium angular blocky; moist, very firm; very hard, dry; few fine $CaCO_3$ segregations; weak effervescence throughout; few nests of gypsum crystals; gradual smooth boundary.
Ccab2 6262	50 to 60 inches. Very dark gray (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) clay; moderate coarse prismatic breaking to moderate medium and fine angular blocky; very firm, moist; very hard, dry; common yellowish brown mottles and many large soft lime segregations; strongly gleyed.

Horizons A1b, A12b2 and Ccab2 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Luton silty clay **LOCATION** Washington County, Nebraska

SOIL NOS. S57Nebr-89-2-(1-8) **LAB. NOS.** 6263-6270

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<10mm)	
0-5	A1p	-	0.1a	-	0.1	0.6	37.5	61.7	7.8	30.4	-	c
5-9	A12	-	-	-	0.1b	0.4b	28.4	71.1	3.0	25.9	-	c
9-12	A1b	-	-	-	-	0.3	27.9	71.8	4.5	23.7	-	c
12-16	Cb	-	-	-	0.1c	0.4c	26.3	73.2	1.8	25.0	-	c
16-26	A1b2	-	-	-	-	0.4d	32.4	67.2	7.8	25.0	-	c
26-38	Cb2	0.1	0.1	-	0.1d	0.3d	26.9	73.4	2.5	23.9	-	c

Soil type: Luton silty clay
Soil No.: S57Nebr-89-2-(1-8)
Location: 300 feet east and 100 feet south of northwest corner Sec. 10, T19N, R11E, Washington County, Nebraska.
Physiography: Nearly level Missouri River flood plain, infrequently flooded.
Relief: 1 to 3 feet.
Slope: Smooth level, less than 0.5 percent.
Parent material: Alluvial clays.
Drainage: Poor; surface drainage has been improved by drainage ditches.
Permeability: Very slow.
Salt or alkali: No evidence of gypsum crystals; considerable segregated $CaCO_3$; may be saline salts in lower horizons.
Land use: Cultivated, wheat 1957. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number	
Alp 6263	0 to 5 inches. Very dark gray (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) silty clay; strong medium and fine granular; firm, moist; hard, dry; weak effervescence; abrupt smooth boundary.
Al2 6264	5 to 9 inches. Very dark grayish brown (2.5Y 3/2 moist) to dark gray (2.5Y 4/1 dry) silty clay; strong medium and fine granular; firm, moist; hard, dry; weak effervescence; few small fragments (snail) throughout and a few fine flecks of segregated lime in lower inch; abrupt smooth boundary.
Alb 6265	9 to 12 inches. Very dark gray (2.5Y 3/1 moist) to very dark gray (2.5Y 3/1 dry) silty clay; moderate medium and fine angular blocks breaking to strong fine granules; firm, moist; very hard, dry; noncalcareous matrix with an occasional fleck of segregated lime; clear smooth boundary.
Cb 6266	12 to 16 inches. Very dark grayish brown (2.5Y 3/2 moist) to very dark gray (2.5Y 3/0 dry) silty clay. Moderate medium blocky breaking to fine and very fine angular blocks; weak to strong effervescence; numerous fine white spots of segregated $CaCO_3$; few calcareous shell fragments; yellowish brown mottles are common, medium and distinct; abrupt smooth boundary.
Alb2 6267	16 to 26 inches. Black (2.5Y 2/1 moist) to dark gray (2.5Y 4/0 dry) clay; strong medium and fine angular blocky; very firm, moist; very hard, dry; yellowish brown and reddish brown mottles are common, fine and distinct; lower part of horizon has some mixing from horizon below; no effervescence; an occasional iron-manganese pellet 1/8 to 1/4-inch in size; clear smooth boundary.
Cb2 6268	26 to 38 inches. Very dark grayish brown (2.5Y 3/2 moist) to dark gray (2.5Y 4/0 dry) clay; moderate coarse prismatic breaking to strong medium angular blocky; very firm, moist; very hard, dry; common medium and coarse yellowish brown mottles; no effervescence except on an occasional firm spot of segregated lime in lower 2 inches of the horizon; clear smooth boundary.
Alb3 6269	38 to 46 inches. Black (2.5Y 2/1 moist) to very dark gray (2.5Y 3/0 dry) clay; moderate medium prismatic breaking to strong medium and fine angular blocky; very firm, moist; very hard, dry; aggregates have shiny coats where moist; matrix is noncalcareous; few fine and medium hard lime concretions; faint yellowish brown mottling but most mottling marked by dark color; abrupt wavy boundary.
Cgca 6270	46 to 60 inches. Consists of several thin horizons of dark 2.5Y 2/1, moist, and slightly lighter and browner 2.5Y 3/2, moist, clay; horizons represent periods of thin deposition and intervals of soil development. Strong medium and fine angular blocky; very firm, moist; plastic, wet; strong effervescence; numerous fine to coarse spots of segregated lime; few distinct fine and medium yellowish brown mottles; entire horizon appears to be gleyed; free water about 68 inches.

Horizons Alb, Alb2 and CgCa were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Marshall silty clay loam LOCATION Washington County, Nebraska

SOIL NOS. S57Nebr-89-5-(1-7) LAB. NOS. 6285-6291

[illegible]

Soil type: Marshall silty clay loam
Soil No.: S57Nebr-89-5-(1-7)
Location: .3 mile west and 180 feet south of northeast corner Sec. 30, T18N, R11E, Washington County, Nebraska.
Physiography: Rolling loess hills, rounded ridge top.
Relief: 100 to 125 feet.
Slope: 6 percent east slope.
Parent material: Peorian loess.
Drainage: Excessive.
Permeability: Moderate.
Salt or alkali: None; lime at 100 inches - segregated - matrix noncalcareous.
Crop: Plowed stubble. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number	
Alp 6285	0 to 6 inches. Very dark grayish brown (10YR 3/2 moist) silty clay loam; weak fine and very fine granular; friable, moist; abrupt smooth lower boundary.
B1 6286	6 to 9 inches. Very dark grayish brown (10YR 3/2 moist) silty clay loam; friable, moist; moderate fine and very fine subangular blocky breaking to a moderate fine granular; clear wavy lower boundary; faces of blocks and granules coated with brown film (crushed color 10YR 5/4); worm casts and dark organic staining common.
B21 6287	9 to 17 inches. Dark brown (10YR 4/3 moist) silty clay loam; weak coarse prismatic breaking to a moderately strong fine and very fine subangular blocky; faces of blocks coated and shiny (crushed color is 10YR 5/4); full of worm casts, some of which are stained a very dark grayish brown; clear wavy lower boundary.
B22 6288	17 to 27 inches. Dark brown or brown (10YR 4/3 moist) silty clay loam; moderate coarse to medium prismatic breaking to a weak fine and very fine subangular blocky; faces are coated and shiny when moist; some worm casts; friable, moist; gradual wavy lower boundary.
B23 6289	27 to 42 inches. Light olive brown (2.5Y 5/4 moist) silty clay loam; very friable, moist; weak coarse prismatic breaking to a weak fine and very fine subangular blocky; many medium distinct gray and yellowish brown mottles; many small pores or channels visible; also, many small black specks (probably manganese) visible; some black staining along old root channels or worm channels; gradual wavy lower boundary.
B3 6290	42 to 54 inches. Light olive brown (2.5Y 5/4 moist) heavy silt loam; very friable, moist; weak coarse prismatic breaking to a weak very fine subangular blocky; many medium gray and yellowish brown mottles; many very fine pores or channels visible; some worm casts throughout; many dark manganese specks and black staining in matrix.
C 6291	54 to 65 inches. Light olive brown (2.5Y 5/4 moist) silt loam; very friable; massive; gray and yellowish brown mottles throughout matrix; manganese specks and streaks are more common than in the B3; small pores and channels common. The B3 and C horizons appeared very similar except for slightly developed structure aggregates in the B3; they appeared to have a faint coating in places but were difficult to recognize as blocks even in the B3 horizon. The mottling is similar in the B3 and C except the C has somewhat more gray mottlings and the manganese specks and streaks were more numerous and somewhat larger.

Note: For practical purposes the B3 and C horizons appeared about the same and distinct differences are hard to recognize except on the profile in the pit. In probing deeper, segregated lime was encountered at 100 inches, but the matrix was noncalcareous. Horizons Alp, B22 and C were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Marshall silty clay loam **LOCATION** Washington County, Nebraska

SOIL NOS. S57Nebr-89-8-(1-6) **LAB. NOS.** 6306-6311

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-7	A1p	0.1a	0.1a	-	0.1b	1.8b	67.2	30.7	41.9	27.2	-	sicl
7-15	B21	-	-	-	0.1b	1.9b	64.3	33.7	38.6	27.7	-	sicl
15-25	B22	-	-	-	0.1b	3.2b	64.6	32.1	40.4	27.5	-	sicl
25-37	B23	-	-	-	0.1b	2.7b	67.3	29.9	42.1	28.0	-	sicl
37-47	B3	-	-	-	0.1b	2.8b	67.9	29.2	43.0	27.8	-	sicl
47-60	C	-	-	-	0.1b	3.4b	68.5	28.0	44.4	27.6	-	sicl

8C1a pH 1:1	pH 1:5	pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10³ MILLIMHOS PER CM	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.2			1.64	.156	10.5							12.7
6.3			0.84	.082	10.2							14.3
6.5			0.43	.048	9.0							13.8
6.7			0.23									13.9
6.8			0.17									13.8
6.9			0.13					-				13.8

Soil type: Marshall silty clay loam
Soil No.: S57Nebr-89-8-(1-6)
Location: 450 feet west and 110 feet north of southeast corner of southwest quarter Sec. 29, T17N, R11E, Washington County, Nebraska.
Physiography: Rolling loess ridge, east slope.
Relief: 80 to 100 feet.
Slope: 6 percent east slope.
Parent material: Peorian loess (Brown loess).
Drainage: Excessive.
Permeability: Moderate to moderately slow.
Salt or alkali: None; no lime in this location to 120 inches.
Land use: 1957, oats and sweetclover. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number	
Alp 6306	0 to 7 inches. Dark brown (10YR 3/3 dry) to very dark brown (10YR 2/2 moist) silty clay loam; hard, dry; very friable, moist; weak fine to very fine granular; some worm casts and channeling. Lime was added to this field one year ago and these lime fragments were in this horizon; effervescence occurred only on these fragments; clear smooth lower boundary.
B21 6307	7 to 15 inches. Brown (10YR 4/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; moderate coarse prismatic breaking to a moderate fine and very fine angular blocky; some worm casts and channeling; roots thick in this horizon; faces of blocks are a shiny brown but when crushed are a yellowish brown (10YR 5/4) when dry; clear wavy lower boundary.
B22 6308	15 to 25 inches. Brown (10YR 5/3 dry) to brown (10YR 4/3 moist) silty clay loam; moderate coarse and medium prismatic breaking to a moderate fine and very fine angular blocky; faces of blocks and prisms have a brown shiny coating but when crushed are a light yellowish brown (10YR 6/4) when dry; many fine pores, channels and worm casts; hard, dry; friable, moist; clear wavy lower boundary.
B23 6309	25 to 37 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) silty clay loam; weak coarse and medium prismatic breaking to a coarse and medium cloddy or weak coarse and medium angular blocky; many small openings or channels plus worm casts; distinct medium-sized yellowish brown and gray mottles; hard, dry; friable, moist; faces of blocks are shiny; some small to medium iron and manganese concretions and many brown to black specks of iron or manganese; clear wavy lower boundary.
B3 6310	37 to 47 inches. Pale brown (10YR 6/3 dry) silty clay loam; weak medium to coarse prismatic breaking to weak coarse and medium blocky or cloddy fragments; entire matrix is mottled with gray and yellowish brown so that basic color of matrix is hard to determine; many small and large iron stains and many small specks which are rusty brown to black; dry, hard; very friable, moist; gradual irregular lower boundary.
C 6311	47 to 60+ inches. Pale brown (10YR 6/3 dry) light silty clay loam; slightly hard, dry; very friable, moist; weak coarse prismatic to massive; entire matrix so mottled with gray and yellowish brown that basic color is difficult to determine; mottlings are many, coarse and distinct; many pores or small channels or openings throughout matrix, many small brownish black and black iron-manganese specks; worm casts or insect workings scattered through matrix.

Note: Borings were made to 120 inches in this hole and no lime was encountered to this depth. The soil material was a continuation of mottled brown loess to 120 inches. The texture also continued as a light silty clay loam. Two samples were taken of this lower loess for correlation--one sample of material from 60 to 100 inches and a second from 100 to 120 inches. Horizons Alp, B22 and C were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Marshall silty clay loam **LOCATION** Washington County, Nebraska

SOIL NOS. S57Nebr-89-9-(1-7) **LAB. NOS.** 6312-6318

DEPTH INCHES	HORIZON	1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
		PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										
0-7	A1p	0.2	0.1	0.1	0.2a	1.6a	69.0	28.8	43.1	27.6	-	sicl
7-11	AB	-	-	-	0.2a	1.3a	65.3	33.2	38.0	28.7	-	sicl
11-17	B21	-	-	0.1	0.2a	1.5a	64.7	33.5	37.5	28.8	-	sicl
17-30	B22	-	0.1	0.1	0.2a	2.4a	64.6	32.6	41.0	26.1	-	sicl
30-40	B23	-	-	0.1	0.3a	3.2a	64.5	31.9	43.2	24.7	-	sicl
40-48	B3	-	-	-	0.2a	3.0a	66.6	30.2	40.8	28.9	-	sicl
48-60	C	-	-	-	0.3a	3.1a	69.0	27.6	42.6	29.7	-	sicl

	pH		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1a			6A1a ORGANIC CARBON	6B1a NITROGEN	C/N	EST% SALT (BUREAU CUP)	EC x 10³ MILLIMHOS PER CM	$CaCO_3$ equivalent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.
1:1	1:5	1:10	%	%				%		%	%	%
5.8			1.78	.160	11.1							11.5
5.9			1.64	.149	11.0							13.9
6.1			1.11	.105	10.6							13.8
6.3			0.54	.058	9.3							13.8
6.5			0.22									14.4
6.8			0.17									14.0
6.8			0.10					-				14.1

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	BASE SAT. % NH_4Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	5B1a Sum Bases	5A3a Sum Cations		4A3a Vol. Wt. g/cc
←	milliequivalents per 100g. soil →							← me/100 g →			
20.8	11.0	3.6	11.0	-	0.8	74	58	15.4	26.4		
23.5	13.5	4.8	9.9	-	0.5	80	66	18.8	28.7		
24.0	14.2	5.9	9.1	0.1	0.5	86	69	20.7	29.3		
24.4	15.4	6.4	7.2	0.1	0.4	91	76	22.3	29.5		1.32
24.9	16.3	6.9	5.6	0.1	0.5	96	81	23.8	29.4		
24.8	16.6	6.9	5.6	0.2	0.4	97	81	24.1	29.7		
24.6	17.0	7.0	4.4	0.3	0.4	100	85	24.7	29.1		1.36

a. Few irregular light brown concr. (Fe-Mn?)

Soil type: Marshall silty clay loam
Soil No.: 857Nebr-89-9-(1-7)
Location: 180 feet south and 135 feet west of northeast corner of southeast quarter of northeast quarter Sec. 25, T17N, R10E, Washington County, Nebraska.
Physiography: Slightly rounded ridge top is dissected loess plain.
Relief: 60 to 80 feet.
Slope: 1 percent, smooth slightly convex.
Parent material: Peorian loess.
Drainage: Well drained.
Permeability: Moderately slow.
Salt or alkali: No carbonates to 120 inches.
Land use: 1957, oats and seeding of alfalfa. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number	
Alp 6312	0 to 7 inches. Very dark brown (10YR 2/2 moist) to dark grayish brown (10YR 3.5/2 dry) silty clay loam; moderate subangular clods breaking to fine and very fine granules; friable, moist; slightly hard, dry; no effervescence; abrupt smooth boundary.
AB 6313	7 to 11 inches. Very dark brown (10YR 2/2 moist) (10YR 3/3 moist crushed) to dark grayish brown (10YR 4.5/2 dry) silty clay loam; moderate fine granular; friable, moist; slightly hard, dry; abundant roots, few worm casts; no effervescence; clear smooth boundary.
B21 6314	11 to 17 inches. Dark brown (10YR 3/3 moist) (10YR 4/3 dry) silty clay loam; weak medium prismatic breaking to fine and very fine subangular blocky; slightly firm, moist; hard, dry; abundant roots, few worm casts and openings, numerous fine and very fine pores; no effervescence; clear smooth boundary.
B22 6315	17 to 30 inches. Dark brown (10YR 3/3.5 moist) (10YR 4/3 moist crushed) to brown (10YR 5.5/3 dry) silty clay loam; moderate medium prismatic breaking to moderate fine and very fine subangular blocky; slightly firm, moist; slightly hard, dry; abundant roots and very fine pores within aggregates; thin continuous coatings on large and small aggregates; fine gray and yellowish brown mottles in lower 2 inches of the horizon that are few, faint and fine; no effervescence; clear smooth boundary.
B23 6316	30 to 40 inches. Dark brown (10YR 3.5/3 moist) to brown (10YR 5.5/3 dry) silty clay loam; weak coarse prismatic breaking to weak medium subangular blocky; slightly firm, moist; slightly hard, dry; numerous fine and very fine pores; abundant roots on faces of large aggregates; common faint fine yellowish brown mottles; common distinct medium strong brown mottles; no effervescence; clear smooth boundary.
B3 6317	40 to 48 inches. Dark brown (10YR 3.5/3 moist) to brown (10YR 5.5/3 dry) silty clay loam; weak coarse prismatic breaking to weak medium and coarse subangular blocky; friable, moist; slightly hard, dry; numerous fine and very fine pores, few medium pores; common faint fine yellowish brown mottles; common distinct medium strong brown mottles; a few dark brown soft fine manganese concretions; few roots; no effervescence; gradual smooth boundary.
C 6318	48 to 60 inches. Brown (10YR 4/3 moist) to pale brown (10YR 6/3 dry) silty clay loam; weak coarse prismatic, no smaller aggregates; thin coating on prisms; mottling as in horizon above with gray mottles common, faint and coarse; no effervescence.

Note: Substrata checked for effervescence to a depth of 120 inches; no effervescence. Horizons Alp, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell silt loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-4-(1-6) **LAB. NOS.** 1959-1964

DEPTH INCHES	HORIZON	1R1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p1	-	0.3	0.3	2.4	24.5	52.8	19.7	56.7	22.4	-	sil
6-10	A1p2	-	0.2	0.3	2.3	24.8	52.0	20.4	55.9	22.7	-	sil
10-16	B2	-	0.3	0.5	3.1	27.9	56.2	12.0	60.9	25.5	-	sil
16-29	C1	-	1.1	1.1	4.2	28.9	54.8	9.9	64.1	22.4	-	sil
29-41	C2	-	0.6	0.7	3.5	34.7	52.5	8.0	66.0	23.8	-	sil
41-60	C3	-	-	1.0	3.5	32.5	56.7	6.3	68.8	23.0	-	sil

pH 8C1b SATURATED PASTE	pH 8C1a 1:5	pH 8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	NITROGEN %	C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
7.8	8.3	8.5	1.00			a	0.9	1				14.1
7.6	8.2	8.5	0.92				0.8	2				14.8
7.7	8.3	8.5	0.44				0.8	6				15.0
7.7	8.3	8.6	0.24				0.8	8	-			13.8
7.7	8.3	8.7	0.13				0.8	7	-			12.7
7.7	8.4	8.7	0.06				0.8	6	-			12.5

5A1a CATION EXCHANGE CAPACITY NH_4OAc	5R1a CATIONS EXTRACTABLE Ca	602b Mg	5B1b EXCHANGEABLE 6P2a Na	6Q2a K	5D2 EXCH. Na %	8A1 SATURATION EXTRACT SOLUBLE 6P1a Na	6Q1a K	8A MOISTURE AT SATURATION %
	milliequivalents per 100g. soil					milliequivalents per liter		
26.3		5.4	0.5	1.8	2	3.5	0.6	52.8
26.4		5.2	0.5	1.9	2	3.5	0.6	53.4
25.4		5.5	0.5	1.7	2	3.5	0.4	52.8
24.7		4.8	0.6	1.6	2	4.1	0.4	49.5
23.6		3.7	0.8	1.5	3	3.8	0.4	50.2

Soil type: Mitchell silt loam
Soil No.: S53Nebr-79-4-(1-6)
Date sampled: October 1, 1953
Location: Eight hundred feet east and 80 feet north of W1/4 corner Sec. 14, T22N R56W, Scotts Bluff County, Nebraska.
Topographic position: Terrace.
Relief: Slight, smooth slope less than 1 percent, north facing.
Drainage: Well drained. Described by: John Elder.
Ground water: 50 to 60 feet.
Salt or alkali: No indication of either or of conditions which would result in accumulation of either at sample site.
Root distribution: Normal throughout. No evidence of limiting horizons.
Land use: Irrigated from ditch--beans 1953. Crop harvested prior to sampling, no yield available.
Mandan

Lab.No.	Horizon	
1959	Alp1	0-6 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam. Weak coarse subangular blocks breaking to weak very fine subangular blocks and weak fine and very fine granules, hard dry, friable moist, strong effervescence, abrupt smooth boundary.
1960	Alp2	6-10 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam. Weak fine subangular blocky to fine and very fine moderate granular (almost completely reworked by worms and insects) slightly hard dry, friable moist, strong effervescence, abrupt, smooth boundary.
1961	B2	10-16 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4.5/3 moist) silt loam. Very weak coarse blocky breaking to weak fine blocks and weak fine granules, slightly hard dry, friable moist, many worm casts and large root and insect openings, violent effervescence; clear, irregular boundary.
1962	C1	16-29 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) silt loam; massive but tends to break to very weak very fine granules or crumbs, soft dry, very friable moist, some small worm casts, a few very fine white lime specks and very fine brownish yellow mottlings, violent effervescence, diffuse wavy boundary.
1963	C2	29-41 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) silt loam; massive crushing to single grain, soft dry, very friable moist, few faint brownish yellow mottles along some root openings, violent effervescence; diffuse, wavy boundary.
1964	C3	41-60 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam; massive crushing to single grain, soft dry, very friable moist, violent effervescence; continues below 60 inches to undetermined depth.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell silt loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-2-(1-6) **LAB. NOS.** 1947-1952

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-7	A1p	-	0.4	0.6	3.3	26.5	52.1	17.1	60.1	20.9	-	sil
7-12	B2	-	0.3	1.0	5.5	23.8	45.1	24.3	50.6	22.0	-	l
12-17	B3	-	-	0.9	5.6	18.2	48.6	26.7	46.1	24.7	-	l
17-28	C1	-	-	0.5	3.2	11.6	59.4	25.3	36.0	37.2	-	sil
28-42	C2	-	-	1.1	6.2	21.6	52.5	18.6	53.7	24.6	-	sil
42-60	C3	-	-	3.2	17.2	24.9	37.1	17.6	57.8	15.5	-	l

8C1b pH SATURATED PASTE	8C1a pH 1:5	8C1a pH 1:10	6A1a ORGANIC MATTER ORGANIC CARBON %	NITROGEN %	C/N	8A2 EST% SALT (BUREAU CUP)	8A1a ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM	6E1a $CaCO_3$ equivalent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
7.8	8.2	8.5	0.80			a	1.2	2				12.4
7.7	8.2	8.5	0.39				1.3	4				15.2
7.7	8.3	8.5	0.30				1.5	10				15.9
7.8	8.5	8.8	0.18				1.4	14	-			16.9
7.8	8.5	8.8	0.07				1.3	6	-			13.3
7.8	8.6	8.9	0.08				1.0	6	-			11.2

5A1a CATION EXCHANGE CAPACITY NH_4OAc	5B1a CATIONS EXTRACTABLE Ca	6O2b Mg	EXCHANGEABLE 6P2a Na	6Q2a K	5D2 EXCH. Na %	8A1 SATURATION EXTRACT SOLUBLE 6P1a Na	6Q1a K	5B1b	8A MOISTURE AT SATURATION %
← milliequivalents per 100g. soil →						← milliequivalents per liter →			
24.0		4.9	1.1	2.0	5	4.9	0.6		49.2
26.5		5.6	1.4	1.9	5	5.5	0.4		55.3
25.5		5.3	1.5	1.6	6	6.1	0.4		55.8
27.4		6.4	1.9	1.9	7	7.0	0.4		57.4
23.0		5.6	1.6	2.4	7	6.7	0.6		46.2
18.8		4.7	1.7	2.0	9	6.4	0.6		39.2

a. Less than 0.20%

Soil type: Mitchell silt loam
Soil No.: S53Nebr-79-2-(1-6)
Location: Near center of Sec. 19, T22N R55W, Scotts Bluff County, Nebraska. North of Highway 86, 1/2 mile west of "turn off" to Scotts Bluff National Monument.
Topographic position: Terrace.
Relief: Slight, flat slope less than 1 percent, north facing.
Drainage: Well drained. Described by: John Elder.
Ground water: Water table about 46 feet.
Salt or alkali: No indication of either at the sample site or nearby.
Root distribution: Normal throughout. No evidence of limiting horizons. Roots most numerous between 7 and 17 inches.
Land use: Irrigated from ditch--beans 1953. Harvested and ground plowed prior to sampling. Farmer reports moderate to high yields. Commercial fertilizer used on beets, not on other crops.

Mandan

Lab.No.	Horizon	
1947	A1p	0-7 inches. Light brownish gray (10YR 6.5/2 dry) to dark grayish brown (10YR 4.5/2 moist) silt loam. Coarse weak subangular blocks breaking to fine and very fine weak granules, slightly hard dry, friable moist, strong effervescence, grades abruptly and smoothly.
1948	B2	7-12 inches. Light brownish gray (10YR 6/2 dry) dark grayish brown (10YR 4/2 moist) silty clay loam. Coarse weak blocky breaking to medium and fine moderate blocks and fine weak granules. Slightly hard dry, friable moist, strong effervescence. The aggregates, when crushed, are slightly lighter than 10YR 4/2 moist, roots are abundant, many worm holes and insect openings are present, some are filled with lighter colored soil material. Gradual, wavy boundary.
1949	B3	12-17 inches. Pale brown (10YR 6.5/3 dry) to brown (10YR 5/3 moist) silty clay loam. Coarse weak subangular blocky breaking to medium and fine weak subangular blocks, friable moist, slightly hard dry. Many large worm holes filled with darker material from above, many fine pore and root openings, few roots, strong effervescence, clear irregular boundary.
1950	C1	17-28 inches. Very pale brown (10YR 7/3 dry) to brown (7.5YR 5/4 moist) silt loam. Coarse very weak subangular blocky breaking to fine and very fine very weak subangular blocks and fine weak granules. Soft dry, friable moist, violent effervescence, many root openings and worm openings, few roots, no segregated lime. Diffuse, smooth boundary.
1951	C2	28-42 inches. Very pale brown (10YR 6.5/3 dry) to brown (10YR 5/3 moist) silt loam; coarse weak subangular blocky breaking to weak medium to fine subangular blocky and very fine weak granules; slightly hard, dry; friable, moist; strong effervescence; many fine white lime spots in pores and old root channels; many fine and very fine pores; diffuse smooth boundary.
1952	C3	42-60 inches. Pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam. Coarse very weak subangular blocky breaking to very fine weak subangular blocks and fine weak granules. Soft dry, friable moist, violent effervescence, few fine white lime spots and coatings in pore and root openings.

Note: Mixing of partially weathered Brule materials gives the 12-17 inch and 17-28 inch horizons a pinkish cast which is accented under moist condition. Horizon of 28-42 inches appeared to be an horizon of an old soil. The dry sample shows only slightly different color from the horizon above. If this is an old surface, development must have been slight.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Monona silt loam **LOCATION** Washington County, Nebraska

SOIL NOS. S57Nebr-89-3-(1-7) **LAB. NOS.** 6271-6277

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-6	A1p	-	-	-	-	1.3	70.4	28.3	42.1	29.6	Tr.	sicl
6-9	A12	-	-	-	-	1.3	69.9	28.8	41.0	30.2	-	sicl
9-15	B21	-	-	-	-	1.2a	69.9	28.9	40.0	31.1	-	sicl
15-27	B22	-	-	-	-	1.6a	70.3	28.1	41.1	30.8	-	sicl
27-34	B23	-	-	-	0.1	1.9a	72.5	25.5	45.6	28.9	-	sil
34-47	B3	-	-	-	-	1.8b	69.0	29.2	41.1	29.7	-	sicl
47-62	C	-	-	-	0.1	2.4a	70.7	26.8	44.2	29.0	-	sil

pH 8C1a 1:1	pH 1:5	pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	ORGANIC MATTER 6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM	6E1a $CaCO_3$ equivalent %	GYPSUM mg./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.0			1.83	.171	10.7							12.0
6.0			1.64	.155	10.6							12.2
6.4			1.13	.108	10.5							12.6
6.7			0.55	.061	9.0							12.7
6.7			0.33					-				12.5
6.7			0.22					-				13.5
7.0			0.15					-				12.8

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	BASE SAT. % NH_4Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	5B1a Sum Bases	5A3a Sum Cations	Vol. Wt. g/cc 4A3a
←	milliequivalents per 100g. soil →							← me/100 g →		
21.7	12.2	3.7	10.0	0.1	0.7	77	62	16.7	26.7	
21.6	12.8	4.9	9.6	-	0.4	84	65	18.1	27.7	
21.9	13.9	5.8	7.7	0.1	0.2	91	72	20.0	27.7	
21.6	14.7	6.4	6.9	0.1	0.2	99	76	21.4	28.3	1.26
20.4	14.2	6.1	4.9	0.1	0.2	100	81	20.6	25.5	
23.3	16.3	6.9	4.4	0.1	0.3	100	84	23.6	28.0	
22.9	16.4	6.8	4.0	0.2	0.3	100	86	23.7	27.7	1.24

a. Common smooth brown concr. (Fe-Mn?)
b. Common smooth brown concr. (Fe-Mn?) Also few $CaCO_3$ concr.

Soil type: Monona silt loam
Soil No.: S57Nebr-89-3-(1-7)
Location: .15 mile north and 100 feet west of southeast corner Sec. 18, T19N, R11E (on ridge top 75 feet west of light pole) Washington County, Nebraska.
Physiography: Gently rolling ridges on loess uplands; 1 percent slope.
Relief: 160 feet to 200 feet.
Parent material: Peorian loess.
Drainage: Excessive.
Permeability: Moderate.
Crop: Oats stubble. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number

A1p 0 to 6 inches. Dark brown (10YR 3/3 dry) to very dark brown (10YR 2/2 moist) silt loam; weak fine and

[redacted]

numerous small pores or openings.

A12 6272 — 6 to 9 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; weak very fine granular; full of worm casts and has many minute openings; very friable, moist; this layer is somewhat compressed like a plow layer; clear wavy boundary.

B21 6273 — 9 to 15 inches. Brown (10YR 5/3 dry) to dark brown (10YR 4/3 moist) silty clay loam; weak coarse and medium prismatic to weak fine and very fine angular blocky; full of worm casts and contains many fine openings; crushed dry color 10YR 5/4; very friable, moist; clear wavy lower boundary.

B22 6274 — 15 to 27 inches. Yellowish brown (10YR 5/4 dry) to dark brown (10YR 4/3 moist) silty clay loam; weak coarse prismatic breaking to weak fine and very fine subangular blocky; friable, moist; worm casts numerous and open channels and fine openings throughout; some dark stainings around worm casts and some very faint light grayish brown mottling; gradual wavy lower boundary.

B23 6275 — 27 to 34 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) silty clay loam; friable, moist; many fine openings or pores and some worm or root channels filled with lighter-colored material. Light grayish brown mottlings are common but faint; gradual wavy lower boundary.

B3 6276 — 34 to 47 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) heavy silt loam; very friable, moist; many small openings and channels throughout; yellowish brown mottlings are medium-sized and distinct throughout; weak coarse prismatic to weak fine and very fine subangular blocky; gradual wavy boundary.

C 6277 — 47 to 62 inches. Pale brown (10YR 6/3 moist) silt loam; very friable, moist; very porous, containing many very fine openings and worm channels; iron stains throughout; gray to yellowish brown mottlings are common and distinct; massive structure.

Horizons A1p, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Monona silt loam **LOCATION** Washington County, Nebraska

SOIL NOS. S57Nebr-89-10-(1-7) **LAB. NOS.** 6319-6325

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	A1p	-	-	-	-	1.3a	74.0	24.7	47.3	28.0	-	sil
6-9	A12	-	-	-	-	1.2a	72.9	25.9	44.2	29.9	-	sil
9-13	B1	-	-	-	0.1	1.0a	74.1	24.8	45.0	30.2	-	sil

Soil type: Monona silt loam
Soil No.: S57Nebr-89-10-(1-7)
Location: .2 mile west and 1200 feet south of northeast corner of northwest quarter Sec. 18, T17N, R12E, Washington County, Nebraska. Approximately 400 feet east and 100 feet north of center of northwest quarter on ridge top; 4½ miles west and 1/2 mile south of Ft. Calhoun, Nebraska.
Physiography: Rounded ridge top in strongly rolling loess country.
Relief: 200 feet.
Slope: 1 percent on top of rounded ridge top.
Parent material: Peorian loess.
Drainage: Excessive.
Permeability: Moderate.
Salt or alkali: None.
Crop: Oats stubble.

Described by: J. A. Elder and H. L. Mollmorgen.

Horizon and Lincoln Lab. Number	
Alp 6319	0 to 6 inches. Dark brown (10YR 4/3 moist) silt loam; weak very fine crumb; slightly hard, dry; very friable, moist; abrupt smooth lower boundary; many fine roots in this material.
A12 6320	6 to 9 inches. Very dark grayish brown (10YR 3/2 moist) silt loam; slightly hard, dry; very friable, moist; moderate fine and very fine granular structure; full of worm casts and many fine openings or small channels; granules have thin shiny dark brown coating, crushed color is 10YR 4/2.
B1 6321	9 to 13 inches. Dark grayish brown (10YR 4.5/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; slightly hard, dry; very friable, moist; moderate fine and very fine subangular blocky; dark shiny coatings on faces of blocks; worm casts numerous and contain many fine pores or openings or channels; clear wavy lower boundary.
B21 6322	13 to 22 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3.5/3 moist) heavy silt loam; moderate fine and very fine subangular blocky; hard, dry; very friable, moist; worm casts throughout this layer; many fine openings and channels; dark coating on faces of blocks; gradual wavy lower boundary.

SOIL SURVEY LABORATORY Lincoln, Nebraska 5/24/57

SOIL TYPE Moody silty clay loam (deep, eroded) **LOCATION** Dixon County, Nebraska

SOIL NOS. S-55-Nebr-26-1-(1-7) **LAB. NOS.** 2855-2861

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-7	A1p	0.3	0.2	0.1	0.3	6.9	61.5	30.7	44.8	23.8	-	sicl
7-13	B1	-	-	0.1	0.3	5.2	60.9	33.5	40.3	26.0	-	sicl
13-21	B21	-	-	-	0.3	5.1	63.1	31.5	40.1	28.3	-	sicl
21-30	B22	0.1	0.1	0.1	0.5	8.4	63.1	27.7	48.7	23.1	-	sicl
30-46	B23	-	-	-	0.2	7.8	65.9	26.1	53.6	20.3	-	sil
46-55	B3	-	-	-	0.2	8.1	67.4	24.3	53.8	21.9	-	sil
55-60	Cca	0.2	0.2	0.1	0.2	8.3	67.4	23.6	53.2	22.7	-	sil

	pH 8C1a		ORGANIC MATTER				ELECTRICAL	6E1a		MOISTURE TENSIONS		
			6A1a	6B1a		EST% SALT (BUREAU CUP)	CONDUCTIVITY EC×10³ MILLIMHOS PER CM @25°C.					4B2
	1:5	1:10	ORGANIC CARBON	NITROGEN	C/N			$CaCO_3$ equivalent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:1			%	%				%		%	%	%
7.8	8.0	8.3	1.52	.150	10.1			2				14.5
7.8	8.1	8.2	0.77	.074	10.4							15.5
7.4	7.7	7.6	0.51	.059	8.6							14.8
7.1	7.4	7.5	0.35	.044	8.0							13.5
6.9	7.4	7.4	0.27									13.1
6.9	7.4	7.4	0.22					-				12.8
7.8	8.4	8.5	0.21					4				12.7

5A1a	EXTRACTABLE CATIONS 5B1a					BASE SAT. %					MOISTURE AT SATURATION %
CATION EXCHANGE CAPACITY NH_4Ac	6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K			4A3a Vol. Wt. g/cc			
← milliequivalents per 100g. soil →											
27.3		4.2		0.1	0.5						
28.7	24.9	6.2		0.1	0.3			1.34			
27.3	22.4	6.6		0.1	0.3						
25.6	19.8	6.0		0.1	0.4			1.35			
23.5	18.8	5.0		0.2	0.4						
23.0	19.1	4.6		0.2	0.4						
21.0		5.0		0.2	0.4			1.24			

Soil type: Moody silty clay loam, deep, eroded
Soil No.: S55Nebr-26-1-(1-7)
Location: .15 mile north and 75 feet east of west quarter corner Sec. 14, T27N, R4E, Dixon County, Nebraska.
Physiography: Gently rolling to rolling loess plain; on 800-foot long west-southwest facing 6 to 8 percent slope, about 300 feet upslope from drain.
Use: Cultivated, corn.
Collected by: D. W. DeMoyde, E. L. Kollmorgen, B. H. Williams, T. A. Wilder, R. D. Greenwalt, T. W. Clanner and

J. S. Allen, July 1955.
Described by: B. H. Williams.

Horizon and Mandan Lab. Number	
Alp 2855	0 to 7 inches. Dark grayish brown to very dark grayish brown (10YR 4/2 dry to 3/2 moist) silty clay loam; weak fine and very fine crumb structure; soft, dry; very friable, moist; calcareous, weak effervescence; a few fine lime concretions, limy material, washed down from eroding higher slope; abrupt lower boundary.
B1 2856	7 to 13 inches. Dark grayish brown to very dark grayish brown (10YR 4/2.5 dry to 3/2.5 moist) silty clay loam; weak coarse prismatic and moderate medium fine and very fine blocky structure; hard, dry; friable, moist; noncalcareous; clear smooth lower boundary.
B21 2857	13 to 21 inches. Brown to dark brown (10YR 5.5/3 dry to 3.5/3 moist) silty clay loam; moderate coarse prismatic and moderate medium and coarse blocky structure; weak to moderate and nearly continuous glaze on ped surfaces; hard, dry; firm, moist; noncalcareous; clear smooth lower boundary.
B22 2858	21 to 30 inches. Pale brown to brown (10YR 6/3 dry to 4/3 moist) silty clay loam; few faint fine gray and yellowish brown mottles; moderate medium prismatic and moderate medium and coarse blocky structure; glaze on peds like in horizon above; hard, dry; firm, moist; plant roots common to many in this horizon and the ones above; noncalcareous; gradual smooth lower boundary.
B23 2859	30 to 46 inches. Pale brown to brown (10YR 6/3 dry to 5/3 moist) silty clay loam, near silt loam boundary; common faint fine gray and yellowish brown mottles and fine streaks and fine dark brown to black soft iron-manganese concretions; plant roots few, old root channels and pores common; weak to moderate coarse prismatic structure; weak discontinuous glaze on ped surfaces; hard, dry; firm, moist; noncalcareous; gradual smooth lower boundary.
B3 2860	46 to 55 inches. Very pale brown to brown (10YR 7/3 dry to 5/3 moist) silt loam; common faint fine gray, strong brown and yellowish brown mottles; weak coarse prismatic structure; slightly hard, dry; friable, moist; common prominent fine dark brown to black iron-manganese streaks and fine soft concretions; no living plant roots observed; old root channels common; noncalcareous; abrupt smooth lower boundary.
Cca 2861	55 to 60 inches. Pale yellow and yellow to olive yellow and light olive brown (2.5Y 7/4 and 7/6 dry to 6/6 and 5/6 moist) silt loam; common distinct medium gray and yellowish brown mottles; massive; slightly hard, dry; friable, moist; a few distinct fine very dark brown iron-manganese streaks and soft concretions; calcareous; violent effervescence; fine streaks and seams of lime and a few hard lime concretions up to 1/2 inch in diameter.

Horizons Alp, B22 and Cca sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. December 1959

SOIL TYPE Moody silty clay loam **LOCATION** Dixon County, Nebraska

SOIL NOS. S59Nebr-26-1-(1-8) **LAB. NOS.** 11370-11377

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-7	A1p	0.1	0.2	0.7	2.2	4.2	62.8	29.8	45.5	22.6	-	sicl
7-10	A12	0.1	0.1	0.3	0.8	2.6	63.4	32.7	38.3	28.1	-	sicl
10-13	A3	0.1	<0.1	0.1	0.4	1.8	63.9	33.7	35.9	30.0	-	sicl
13-19	B1	<0.1	<0.1	0.1a	0.3b	1.4b	64.7	33.5	33.4	32.9	-	sicl
19-31	B21	<0.1	<0.1	<0.1	0.1b	2.2b	62.5	35.2	36.7	28.1	-	sicl
31-39	B22	<0.1	<0.1	<0.1	0.3b	3.7b	63.4	32.6	41.8	25.5	-	sicl
39-46	B3	<0.1	<0.1	0.2a	0.6b	7.2b	60.2	31.8	45.5	22.3	Tr.	sicl
46-60	C	<0.1	0.1a	0.2a	0.8b	8.3b	65.2	25.4	53.3	20.7	Tr.	sil

Soil type: Moody silty clay loam
Soil No.: S59Nebr-26-1-(1-8)
Location: 750 feet west and 250 feet south of Center Sec. 22, T28N, R4E, Dixon County, Nebraska. Northeast Nebraska Experiment Station.
Physiography: Rolling loess hills.
Relief: 50 to 100 feet.
Slope: 6 percent west - convex.
Parent material: Peorian loess.
Drainage: Well.
Permeability: Moderately slow.
Land Use: Cultivated.
Described by and date: J. V. Drew and J. A. Elder, June 25, 1959.

Lincoln Lab. No.	Horizon	Depth	
11370	A_{1p}	0-7"	Very dark brown (10YR 2/2 moist) silty clay loam. Weak very fine granular structure. Friable moist, slightly hard dry. Abundant roots. No effervescence. Abrupt smooth boundary.
11371	A_{12}	7-10"	Very dark brown (10YR 2/2 moist) silty clay loam. Moderate fine granular structure. Friable moist, slightly hard dry. Abundant roots. No effervescence. Clear smooth boundary.
11372	A_3	10-13"	Very dark grayish brown (10YR 3/2 moist) (10YR 4/2.5 moist crushed) silty clay loam. Moderate fine subangular blocky breaking to fine granular structure. Friable moist, slightly hard dry. No effervescence. Clear smooth boundary.
11373	B_1	13-19"	Dark brown (10YR 3/3 moist) (10YR 4/3 moist crushed) silty clay loam. Weak fine prismatic breaking to moderate fine subangular blocky structure. Friable moist, hard dry. No effervescence. Clear smooth boundary.
11374	B_{21}	19-31"	Dark brown (10YR 4/3 moist) (10YR 4/3 moist crushed) silty clay loam. Weak medium prismatic breaking to moderate fine angular blocky structure. Firm moist, hard dry. A few thin discontinuous clay films on aggregates. No effervescence. Gradual smooth boundary.
11375	B_{22}	31-39"	Dark brown (10YR 4/3 moist) silty clay loam. Weak medium prismatic breaking to moderate medium and fine subangular blocky structure. Firm moist, hard dry. Thin discontinuous clay films on larger aggregates. No effervescence. Many medium distinct gray mottles and common fine distinct strong brown iron stains. Clear smooth boundary.
11376	B_3	39-46"	Dark brown (10YR 4/3 moist) silty clay loam. Weak medium and fine subangular blocky structure. Friable moist, slightly hard dry. Many medium distinct gray mottles. Many fine distinct strong brown and dark brown iron stains. Slight effervescence in lower inch. Abrupt wavy boundary.
11377	C	46-60"	Dark grayish brown (10YR 4/2.5 moist)* silty clay loam. Very friable moist, soft dry. A few soft and an occasional large 1/4-3/4-inch $CaCO_3$ concretions. Lime in pores and openings. Strong effervescence. Worm working common. Coats are

SOIL SURVEY LABORATORY Mundan, N. Dak.[a/] 3/20/56

SOIL TYPE Moody silty clay loam, eroded **LOCATION** Wayne County, Nebraska

SOIL NOS. 354Nebr-90-2-(1-7) **LAB. NOS.** 2171-2177

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-7½	Ap	0.1	0.2	0.1	0.4	4.2	58.2	36.8	42.4	20.3	-	sicl
7½-18	B21	-	-	-	0.2	5.6	58.2	36.0	42.1	21.7	-	sicl
18-26	B22	-	-	-	0.2	4.5	62.8	32.5	43.3	24.1	-	sicl
26-33	B23	-	-	0.1	0.3	5.1	64.6	29.9	45.0	21.9	-	sicl
33-44	B3	-	-	0.2	0.5	6.4	56.3	36.6	48.0	15.0	-	sicl
44-47	C	-	-	-	0.3	5.2	66.2	28.3	49.9	21.7	-	sicl
47-60	Cca	0.1	0.1	0.1	0.5	6.9	67.8	24.5	50.7	24.4	-	sil

	pH		ORGANIC MATTER				6E1a		MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST'D SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.0	6.4	6.6	2.32	.214	10.8			-				16.0
6.0	6.7	7.0	1.14	.116	9.8			-				15.5
6.4	7.2	7.3	0.47	.058	8.1			-				14.5
6.6	7.3	7.4	0.27					-				13.6
6.7	7.5	7.7	0.20					-				13.1
6.9	7.3	7.8	0.19					-				13.4
7.7	8.5	8.8	0.16					5				12.3

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %			5A3a Sum Cations	8D3		MOISTURE AT SATURATION
	6N2b Ca	6Q2b Mg	H	6P2a Na	6Q2a K	5C1	Na	K	me/100g	Ca/Mg		%
← milliequivalents per 100g. soil →												
29.2	17.6	6.5		0.1	1.6	88			25.8	2.7		
28.8	18.6	7.7		0.1	0.4	93			26.8	2.4		
26.5	18.0	7.5		0.2	0.4	98			26.1	2.4		
25.0	17.4	7.3		0.2	0.4	100			25.3	2.4		
24.0	17.1	7.0		0.3	0.4	100			24.8	2.4		
24.1	17.3	6.9		0.3	0.4	100			24.9	2.5		
22.1				0.3	0.5							

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Moody silty clay loam, eroded
Soil No.: S54Nebr-90-2-(1-7)
Location: 120 feet north of south quarter corner Sec. 35, T26N, R3E, Wayne County, Nebraska.
Topography: Slightly convex ridge top with 4 percent northward dip to the ridge; rolling landscape with total relief of 80 to 100 feet.
Use. Cultivated, corn 1954.
Described by: B. H. Williams

Mandan Lab. No.	Horizon	Depth	
2171	A_p	0-7⅓"	Dark grayish brown (10YR 4/1.5, dry) to very dark brown (10YR 2.5/2, moist) silty clay loam; weak fine granular structure; slightly hard, dry; friable, moist; abrupt smooth lower boundary, except slight A3 or B1 tonguing 2 or 3 inches into the next (B_{21}) horizon.
2172	B_{21}	7⅓-18"	Yellowish brown (10YR 5/4, dry) to dark brown (10YR 4/3, moist) silty clay loam, with slight tonguing of darker material and numerous worm casts from the horizon above; compound weak coarse prismatic, weak medium and coarse blocky and moderate medium granular in the darker crack-filling material; hard, dry; friable, moist; gradual smooth lower boundary.
2173	B_{22}	18-26"	Yellowish brown (10YR 5/4, dry) to dark brown (10YR 3.5/3, moist) silty clay loam; compound weak coarse prismatic and moderate coarse blocky structure; hard, dry; friable, moist; slight glaze on blocky peds and some dark organic staining along vertical cleavage planes; clear smooth lower boundary.
2174	B_{23}	26-33"	Yellowish brown (10YR 5.5/4, dry) to dark yellowish brown (10YR 4.5/3, moist) silty clay loam; a few faint fine gray mottles in lower 2 or 3 inches; compound weak coarse prismatic and moderate coarse blocky structure; hard, dry; friable, moist; weak glaze most structure planes; a few fine thread-like pores and channels; clear smooth lower boundary.
2175	B_3	33-44"	Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 5/4, moist) silty clay loam; few faint fine gray and dark yellowish brown mottles and very dark brown iron-manganese stains; compound weak coarse prismatic and weak coarse blocky structure; soft, dry; friable, moist; numerous thread-like pores and tubes; clear smooth lower boundary.
2176	C	44-47"	Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 5/4, moist) heavy silt loam; few faint fine gray and strong brown mottles; massive; soft, dry; friable, moist; numerous fine thread-like pores; clear smooth lower boundary.
2177	C_{ca}	47-60"	Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 5/4, moist) silt loam; common faint fine and coarse gray and strong brown mottles and very dark brown iron-manganese stains; massive; soft, dry; friable, moist; numerous fine and medium pores and thread-like channels; gray and brown staining, somewhat concentric, around the channels; calcareous, with effervescence only on lime spots and concretions in the upper part; strong effervescence throughout in the lower part.

SOIL SURVEY LABORATORY Lincoln, Nebr. February, 1959

SOIL TYPE *Morrill clay loam LOCATION Saunders County, Nebraska

SOIL NOS. S58Nebr-78-2-(1-8) LAB. NOS. 8422-8429

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-5	A1p	1.7	5.0	4.3	10.3	8.0	48.5	22.2	48.3	13.5	Tr.	l
5-9	A12	0.7	5.0	4.1	8.8	7.7	47.6	26.1	44.4	15.2	Tr.	l
9-12	A3	3.1	6.9	3.9	3.9	11.2	41.6	29.4	38.5	14.4	Tr.	cl

Soil type: *Morrill clay loam
Soil No.: S58Nebr-78-2-(1-8)
Location: 160 feet east and 40 feet north of south quarter corner Sec. 15, T13N, R6E; approximately 2 miles north and 4 miles west of Ceresco, Saunders County, Nebraska.
Physiography: Dissected till plain (lower section Kansan till).
Relief: 40 to 50 feet.
Slope: 7 percent north facing slope.
Parent material: Mixed Kansan sands and till remnants.
Erosion: Moderate.
Drainage: Well to excessive.
Permeability: Moderately slow.
Land use: Corn 1958. Described by: W. E. McKinzie and J. A. Elder.

Horizon and Lincoln Lab. Number	
Alp 8422	0 to 5 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) light clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
A12 8423	5 to 9 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) silty clay loam; weak coarse subangular blocky to weak fine granular; friable, moist; no effervescence; worm activity transported in material from lower horizons; clear smooth boundary.
A3 8424	9 to 12 inches. Dark reddish brown (5YR 3/2 moist) to dark brown (7.5YR 4/2 dry) silty clay loam; weak coarse subangular blocky to moderate fine and medium granular; friable, moist; no effervescence; clear wavy boundary.
B21 8425	12 to 19 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) silty clay loam; weak coarse subangular blocky to weak fine and medium subangular blocky; friable, moist; no effervescence; gradual smooth boundary.
B22 8426	19 to 28 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) clay loam; weak coarse prismatic to weak fine and medium blocky; firm, moist; no effervescence; gradual smooth boundary.
B23 8427	28 to 40 inches. Yellowish red (5YR 4/6 moist) to yellowish red (5YR 5/6 dry), crushed color (5YR 5/6 moist) clay loam; weak coarse prismatic to weak medium and fine subangular blocky; firm, moist; no effervescence; gradual smooth boundary.
C1 8428	40 to 51 inches. Reddish yellow (7.5YR 6/6 moist) to reddish yellow (7.5YR 7/6 dry), crushed color (7.5YR 5/4 moist) light clay loam; weak coarse prismatic; friable, moist; no effervescence; clear smooth boundary.
C2 8429	51 to 60 inches. Strong brown (7.5YR 5/6 moist) to reddish yellow (7.5YR 6/6 dry) loamy sand; massive; very friable, moist; no effervescence; large rodent burrows filled with material from horizon above.

Note: Few gravels scattered throughout profile; aftonian silts present at 90 inches.

SOIL SURVEY LABORATORY Lincoln, Nebr. February 1959

SOIL TYPE *Morrill clay loam LOCATION Saunders County, Nebraska

SOIL NOS. S58Nebr-78-4-(1-8) LAB. NOS. 8441-8448

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-7	A1p	0.2	3.8	6.8	19.0	10.2	39.1	20.9	48.5	11.6	-	l
7-9	A12	0.6	4.7	6.8	11.6	14.7	38.4	23.2	45.1	11.9	-	l
9-12	A3	0.6	5.1	6.3	12.5	7.3	39.0	29.2	39.7	13.1	-	cl
12-22	B21	0.6	6.1	7.1	9.8	5.7	40.4	30.3	35.9	14.4	-	cl
22-34	B22	1.2	7.8	9.4	8.8	8.6	37.5	26.7	37.0	10.6	Tr.	l
34-42	B23	0.9	9.0	13.0	17.2	6.6	30.7	22.6	34.4	9.6	Tr.	l
42-54	C1	2.2	13.9	16.7	13.6	13.0	21.4	19.2	29.4	6.9	Tr.	sl
54-60	C2	0.7	18.0	22.2	16.2	6.2	21.3	15.4	26.3	7.1	-	sl

Soil type: Morrill clay loam
Soil No.: 58Nebr-78-4-(1-8)
Location: 300 feet west and 150 feet south of north quarter corner Sec. 26, T13N, R5E. (Straight west of south end of long shed in farmstead which is located approximately .25 mile east). Approximately 1/2 mile south and 1 mile east of Valparaiso, Saunders County, Nebraska.
Physiography: Dissected till plain (lower section of Kansan till).
Relief: 40 to 50 feet.
Slope: 9 percent east facing slope.
Parent material: Mixed Kansan sands and till remnants.
Erosion: Moderate.
Drainage: Well to excessive.
Permeability: Moderately slow.
Land use: Corn 1958. Described by: W. E. McKinzie and J. A. Elder.

Horizon and Lincoln Lab. Number	
A1p 8441	0 to 7 inches. Very dark brown (10YR 2/2 moist) to dark brown (10YR 3/3 dry) light clay loam; weak fine granular; very friable, moist; no effervescence; abrupt smooth boundary.
A12 8442	7 to 9 inches. Very dark brown (10YR 2/2 moist) to dark grayish brown (10YR 4/2 dry) light silty clay loam; weak coarse subangular blocky to weak fine and medium granular; friable, moist; no effervescence; rodents have brought up material from lower horizons; clear smooth boundary.
A3 8443	9 to 12 inches. Dark brown (7.5YR 3/2 moist) to dark brown (7.5YR 4/2 dry) silty clay loam; weak coarse subangular blocky to weak fine and medium granular; friable, moist; no effervescence; clear smooth boundary.
B21 8444	12 to 22 inches. Dark reddish brown (5YR 3/4 moist) (5YR 4/4 moist crushed) to reddish brown (5YR 5/4 dry) silty clay loam; moderate coarse prismatic to moderate fine and medium subangular blocky; firm, moist; no effervescence; gradual smooth boundary.
B22 8445	22 to 34 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) clay loam; weak coarse prismatic to moderate fine and medium subangular blocky; firm, moist; no effervescence; thin continuous clay skins; gradual smooth boundary.
B23 8446	34 to 42 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) clay loam; weak coarse prismatic to weak medium subangular blocky; firm, moist; no effervescence; thin patchy clay skins on faces of aggregates; gradual smooth boundary.
C1 8447	42 to 54 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) silty clay loam; weak coarse subangular blocky; firm, moist; no effervescence; gradual smooth boundary.
C2 8448	54 to 60 inches. Dark brown (7.5YR 4/4 moist) to brown (7.5YR 5/4 dry) light clay loam; weak coarse subangular blocky; friable, moist; no effervescence.

SOIL SURVEY LABORATORY Lincoln, Nebr. December 1959

SOIL TYPE Nora silty clay loam **LOCATION** Dixon County, Nebraska

SOIL NOS. S59Nebr-26-2-(1-8) **LAB. NOS.** 11378-11385

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-5	A1p	0.2	0.2	0.9	2.8	6.7	59.5	29.7	48.9	18.7	-	sicl
5-9	A12	<0.1	0.1	0.2	0.8	5.7	60.2	33.0	46.5	19.8	-	sicl
9-13	A3	<0.1	<0.1	0.1	0.3	6.2	62.0	31.4	47.5	20.9	-	sicl
13-17	B21	<0.1	<0.1	<0.1	0.3	8.1	62.5	29.1	50.9	19.9	-	sicl
17-22	B22	<0.1	<0.1	<0.1	0.5a	7.1a	64.9	27.5	54.4	18.0	-	sicl/sil
22-36	B3ca	0.4b	0.1b	0.1b	0.7b	7.6b	68.6	22.5	55.9	20.8	Tr.	sil
36-50	C1	<0.1	<0.1	0.1b	0.8b	9.1b	69.0	21.0	59.3	19.4	Tr.	sil
50-60	C2	0.1b	0.1b	0.1b	1.0b	9.4b	69.0	20.3	60.9	18.3	Tr.	sil

8C1a pH 1:1	pH 1:5	pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	Free Iron Fe_2O_3% 6C1a	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM @25°C.	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.1			1.97	0.174	11.3	1.3						12.5
6.5			1.52	0.143	10.6	1.5						14.7
6.8			0.98	0.098	10	1.5						13.8
7.0			0.67	0.073	9	1.5						12.9
7.0			0.55	0.064	8	1.5						12.6
8.0			0.30	0.040	8	1.3		9				10.8
8.2			0.14			1.3		8				10.3
8.2			0.12			1.4		8				9.9

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	BASE SAT. % NH_4Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	Sum Ext. Bases 5R1a	Sum Ext. Cations 5A3a	Ca/Mg 8D3	MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →										
21.8	14.7	4.9	7.0	<0.1	0.9	94	74	20.5	27.5	3.0	
25.0	17.5	5.8	5.8	0.1	0.5	96	80	23.9	29.7	3.0	
23.0	17.7	5.8	4.3	0.1	0.4	104	85	24.0	28.3	3.0	
22.0	17.2	5.4	3.5	0.1	0.4	105	87	23.1	26.6	3.2	
21.3	17.3	5.3	3.3	0.1	0.4	108	88	23.1	26.4	3.3	
17.9		5.2	<0.1	0.1	0.4						
17.0		6.7	<0.1	0.1	0.3						
16.9		7.7	<0.1	0.2	0.4						

a. Few (Fe-Mn?) concr.
b. Few (Fe-Mn?) concr. Few carbonate concr. ($CaCO_3$?)

Soil type: Nora silty clay loam
Soil No.: S59Nebr-26-2-(1-8)
Location: 950 feet west and 200 feet south of Center Sec. 22, T28N, R4E, Dixon County, Nebraska. Northeast Nebraska Experiment Station.
Physiography: Rolling loess hills.
Relief: 50 to 100 feet.
Slope: 6 percent southwest, convex.
Parent material: Peorian loess.
Drainage: Well.
Permeability: Moderately slow.
Land use: Cultivated.
Described by and date: J. V. Drew, and J. A. Elder, June 25, 1959.

Lincoln Lab. No.	Horizon	Depth	
11378	A_{1p}	0-5"	Very dark brown (10YR 2/2 moist) silty clay loam. Weak very fine granular structure. Friable moist, slightly hard dry. Abundant roots. No effervescence. Abrupt smooth boundary.
11379	A_{12}	5-9"	Very dark grayish brown (10YR 3/2 moist) (crushed, 10YR 3/3 moist) silty clay loam. Moderate fine granular structure. Friable moist, slightly hard dry. No effervescence. Clear smooth boundary.
11380	A_3	9-13"	Very dark grayish brown (10YR 3/2 moist) (crushed, 10YR 4/3 moist) silty clay loam. Moderate fine and very fine granular structure. Friable moist, slightly hard dry. No effervescence. Clear smooth boundary.
11381	B_{21}	13-17"	Dark brown (10YR 4/3 moist, crushes to 10YR 4/4 moist) silty clay loam. Weak coarse and medium subangular blocky breaking to weak fine subangular blocky structure. Friable moist, hard dry. No effervescence. Clear smooth boundary.
11382	B_{22}	17-22"	Dark brown (10YR 4/3 moist, crushes to 10YR 4/4 moist) silty clay loam. Weak medium subangular blocky structure. Friable moist, hard dry. No effervescence. Abrupt wavy boundary.
11383	B_{3ca}	22-36"	Dark yellowish-brown (10YR 4/4 moist, same color when crushed) silty clay loam. Weak medium subangular blocky structure. Friable moist, slightly hard dry. Few medium distinct gray mottles. Common faint yellowish brown coarse iron stains. Violent effervescence, numerous hard dense concretions 1/8 to 3/8" in diameter. Gradual smooth boundry.
11384	C_1	36-50"	Yellowish brown (10YR 5/4 moist)* silty clay loam. Weak coarse prismatic breaking to weak fine and medium subangular blocky structure. Very friable moist, soft dry. Few prominent reddish brown stains, common medium distinct gray mottles. Common faint yellowish brown iron stains. Violent effervescence, scattered hard lime concretions. Gradual smooth boundary.
11385	C_2	50-60"	Same as above except slightly softer consistency, dry. Fewer lime concretions and more reddish brown iron-manganese stains.

* Tending toward 2.5Y hue.

SOIL SURVEY LABORATORY Lincoln, Nebr. 5/24/57

SOIL TYPE Nora silty clay loam **LOCATION** Dixon County, Nebraska

SOIL NOS. S-55-Nebr-26-2-(1-6) **LAB. NOS.** 2862-2867

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	Ap	0.5	0.5	0.2	0.3	6.4	66.2	25.9	49.5	23.3	-	sil
6-14	B21ca	0.5	0.2	0.1	0.3	5.1	69.6	24.2	49.2	25.7	-	sil
14-23	B22ca	0.4	0.2	0.1	0.3	6.2	68.5	24.3	50.6	24.3	-	sil
23-32	B23ca	0.1	0.2	0.1	0.3	4.5	69.5	25.3	50.0	24.2	-	sil
32-40	Cca	0.2	0.1	-	0.1	4.5	70.5	24.6	50.3	24.8	-	sil
40-60	C	0.1	0.1	-	0.2	4.6	69.9	25.1	48.7	26.0	-	sil

pH 8C1a 1:1	1:5	1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10^3 MILLIMHOS PER CM @25°C.	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
8.0	8.4	8.6	1.08	.113	9.6			9				12.3
8.0	8.5	8.7	0.48	.054	8.9			11				11.6
8.1	8.5	8.7	0.35	.040	8.8			10				11.8

Soil type: Nora silty clay loam
Soil No.: S55Nebr-26-2-(1-6)
Location: .15 mile north and 175 feet east of west quarter corner Sec. 14, T27N, R4E, Dixon County, Nebraska; about 100 feet upslope from site of profile S55Nebr-26-1.
Physiography: Gently rolling to rolling loess plain; near middle of an 800-foot long west-southwest facing slope.
Use: Cultivated, corn.
Collected by: D. W. DeMoude, H. L. Kollmorgen, B. H. Williams, J. A. Elder, R. D. Greenawalt, T. F. Clapper and J. S. Allen, July 1955.
Described by: B. H. Williams.

Horizon and
Mandan
Lab. Number

[redacted]

cence; a few hard small concretions; abrupt smooth lower boundary. This layer consists mainly of B horizon material in which some organic matter has been incorporated through tillage.

B21ca
2863 — 6 to 14 inches. Light yellowish brown to olive brown (2.5Y 6/3 dry to 4/3 moist) silty clay loam; few faint fine gray, yellowish brown and strong brown mottles; weak to moderate medium prismatic and weak coarse and medium blocky structure; calcareous; thin seams and streaks of segregated soft lime and fairly abundant hard concretions 2 to 5 mm. in diameter; violent effervescence; clear smooth lower boundary.

B22ca
2864 — 14 to 23 inches. Light yellowish brown to olive brown (2.5Y 6/4 dry to 4/4 moist) silty clay loam; common distinct fine and medium gray and yellowish brown mottles and a few very fine soft iron-manganese concretions; weak medium prismatic and medium and fine blocky structure; slightly hard, dry; friable, moist; plant roots common to many in this horizon and the ones above; calcareous; violent effervescence; abundant hard lime concretions 2 to 4 mm. in diameter; gradual wavy lower boundary.

B23ca
2865 — 23 to 32 inches. Light yellowish brown to light olive brown (2.5Y 6/4 dry to 5/4 moist) silt loam; many prominent medium and fine gray, yellowish brown and strong brown mottles; weak coarse prismatic and weak medium subangular blocky; slightly hard, dry; friable, moist; a few living plant roots, old root channels common; calcareous; violent effervescence; fewer lime concretions than in horizon above; gradual wavy lower boundary.

Cca
2866 — 32 to 40 inches. Light yellowish brown to light olive brown (2.5Y 6/4 dry to 5/4 moist) silt loam; common distinct medium gray and yellowish brown mottles and dark brown to black soft iron-manganese concretions; weak coarse prismatic structure; slightly hard, dry; friable, moist; many root channels; calcareous; violent effervescence; a few hard lime concretions.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1959

SOIL TYPE Pawnee clay loam **LOCATION** Pawnee County, Nebraska

SOIL NOS. S58Nebr-67-1-(1-7) **LAB. NOS.** 9132-9138

DEPTH IN FEET	HORIZON	1Bla PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)								3A1	2A2	TEXTURAL CLASS
		VERY COARSE	COARSE	MEDIUM	FINE	VERY FINE						

Soil Type: Pawnee clay loam

Location: 0.2 miles west and 160 feet south of center of Sec. 19, T2N, R12E, located about 2 miles east and 1 mile north of Pawnee City, Pawnee County, Nebraska.
Date Sampled: September 11, 1958.
Collectors: R. Jordan, J. Elder, R. Greenawalt.
Use: Cultivated (corn 1958).
Climate: Average annual precipitation 31 inches, average annual temperature 53° F.
Parent Material: Glacial till.
Physiography: Glacial upland (loess-covered ridge tops).
Slope: 6 percent west.
Soil No.: S58Nebr-67-1-(1-7)
Lincoln

Lab.No.	Horizon	
9132	Alp	0-7 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) clay loam; moderate fine and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9133	A12	7-11 inches. Dark grayish brown (10YR 4/2 dry) to very dark gray (10YR 3/1 moist) clay loam; moderate medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; gradual smooth lower boundary.
9134	AB	11-17 inches. Dark brown (7.5YR 4/2 dry) to dark brown (10YR 3/3 moist) clay; a few fine prominent olive brown mottles; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9135	B21	17-28 inches. Dark yellowish brown (10YR 4/4 dry) to dark yellowish brown (10YR 3/4 moist) clay; moderate medium and fine blocky structure; the sides of the blocks are slicked and at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9136	B22	28-38 inches. Yellowish brown (10YR 5/6 dry) to dark yellowish brown (10YR 4/4 moist) clay with a few gravels and many medium distinct grayish brown mottles; weak coarse blocky structure; the sides of the blocks are slicked and at a 45° angle; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary.
9137	B3	38-48 inches. Mottled 50% light brownish gray (2.5Y 6/2 dry), 50% yellowish brown (10YR 5/8 dry) to 50% grayish brown (2.5Y 5/2) and 50% yellowish brown (10YR 5/6 moist) clay; weak medium blocky structure; very hard dry, very firm moist; weakly calcareous; with a few soft lime concretions; gradual smooth lower boundary.
9138	C	48-63 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) clay; many coarse distinct yellowish brown mottles; moderate medium and coarse blocky structure; very hard dry, firm moist; disseminated lime with large to small lime masses.

Note: Dark material has been carried down into the AB and B21 horizons in cracks and cleavage plains from the surface. The dry colors were crushed. Many dark coatings and concentrations of dark material, probably iron and manganese, are present in the C horizon. Horizons Alp, B21 and C were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1959

SOIL TYPE Pawnee clay loam LOCATION Pawnee County, Nebraska

SOIL NOS. S58Nebr-67-3-(1-8) LAB. NOS. 9148-9155

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 <2mm	
0-6	A1p	1.2a	4.1a	5.6a	8.9a	4.9a	50.0	25.3	37.7	21.8	Tr.	sil/l
6-10	A12	2.3a	4.1a	4.7a	7.0a	4.2a	45.5	32.2	31.7	21.6	Tr.	cl
10-14	AB	2.2a	3.6a	4.0a	6.5a	4.3a	42.7	36.7	29.0	21.3	Tr.	cl
14-24	B21	2.1a	4.1a	3.5a	6.1a	3.8a	32.7	47.7	22.8	16.6	Tr.	c
24-32	B22	4.3a	4.2a	4.2a	7.5a	5.0a	29.5	45.3	22.7	15.4	4	c
32-45	B23	3.2b	5.2b	5.2b	8.9b	5.8b	30.0	41.7	23.7	16.2	3	c
45-53	B3	2.2b	4.8b	5.1b	9.8b	6.5b	30.6	41.0	25.0	16.6	Tr.	c
53-63	C	2.9b	4.5b	5.4b	9.9b	7.0b	31.8	38.5	26.6	16.9	Tr.	cl

Soil Type: Pawnee clay loam
Classification: Brunizem
Location: 0.3 miles west and 350 feet south of NE corner Sec. 2, T2N, R11E, about 4 miles north of Pawnee City, Pawnee County, Nebraska.

Date Sampled: September 12, 1958.
Collectors: R. Jordan, R. Greenawalt.
Use: Cultivated (wheat 1958).
Climate: Average annual precipitation 31 inches; average annual temperature 53° F.
Parent Material: Glacial till.
Physiography: Glacial upland (loess-covered ridge tops).
Slope: 6 percent west.
Soil No.: S58Nebr-67-3-(1-8)
Lincoln

Lab. No.	Horizon	
9148	A1p	0-6 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) clay loam; moderate fine and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9149	A12	6-10 inches. Very dark grayish brown (10YR 3/2 dry) to very dark brown (10YR 2/2 moist) clay loam; moderate medium granular structure; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9150	AB	10-14 inches. Dark yellowish brown (10YR 3/4 dry) to dark brown (10YR 3/3 moist) clay with a few fine prominent dark red mottles; moderate medium and fine blocky structure; hard dry, friable moist; noncalcareous; gradual smooth lower boundary.
9151	B21	14-24 inches. Dark brown (10YR 3/4 dry) and dark brown (10YR 3/4 moist) clay with a few gravels; moderate coarse and medium blocky structure; the sides of the blocks are slicked and at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9152	B22	24-32 inches. Dark yellowish brown (10YR 4/4 dry) and dark brown (10YR 4/3 moist) clay with a few gravels; weak coarse blocky structure; the sides of the blocks are slicked at a 45° angle; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary.
9153	B23	32-45 inches. Dark yellowish brown (10YR 4/4 dry) to yellowish brown (10YR 5/6 moist) clay with many medium distinct weak red mottles; weak coarse blocky structure; very hard dry, very firm [illegible]

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud silt loam, deep **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-1-(1-8) **LAB. NOS.** 5795-5802

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-6	A1p	4.5	6.8	4.2	5.6	16.1	43.9	18.9	45.3	17.5	5	l
6-8	A12	5.6	6.9	4.0	5.6	15.0	43.5	19.4	43.9	17.3	5	l
8-11	B1	4.1	7.1	4.3	5.5	11.0	40.6	26.5	39.2	15.9	3	l
11-20	B2	1.3	2.8	2.4	3.4	12.5	44.4	33.2	42.2	16.4	-	cl
20-23	B3ca	0.8a	2.2b	2.4b	3.7b	15.6b	46.7	28.6	46.9	17.7	Tr.	cl
23-28	C1	1.0a	3.6b	3.7b	5.9b	19.3b	45.3	21.2	51.2	16.9	Tr.	l
28-34	D1	4.9a	10.9b	9.1b	12.1b	18.9b	29.7	14.4	44.8	10.3	3	fsl
34-45	D2	35.7a	18.4b	8.1b	6.7b	6.1b	8.1	16.9	12.6	4.8	46	cosl

	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1b Saturated Paste	8C1a 1:1	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST'D SALT (BUREAU CUP)	EC x 10³ MILLIMHOS PER CM 8A1a	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS.
7.1	7.6	8.1	1.27	.109	11.6	<0.20	0.8	-				9.0
6.9	7.3	7.7	1.20	.102	11.8	<0.20	0.7	-				9.2
6.6	7.3	7.7	0.65	.064	10.2	<0.20	0.6	-				12.0
6.7	7.6	8.0	0.52	.060	8.7	<0.20	0.6	-				16.3
7.6	8.3	9.0	0.74	.091	8.1	<0.20	0.8	9				15.3
7.7	8.5	9.2	0.35	.038	9.2	<0.20	0.8	12				12.3
7.9	8.7	9.4	0.12			<0.20	0.9	8				7.3
7.9	8.8	9.3	0.05			<0.20	1.0	8				8.8

5A1a	EXTRACTABLE CATIONS 5B1a					5D2	SATURATION EXTRACT SOL 8A1a			4A3a	8A
CATION EXCHANGE CAPACITY NH_4Ac	6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	EXCH. Na %	6P1a Na	6Q1a K		Vol Wt. g/cc	MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →						← milliequivalents per liter →				
16.8	13.3	2.1	4.7	-	2.1	-	0.2	1.5			39.0
16.6	12.1	2.4	4.3	-	1.9	-	0.3	1.0			39.2
19.1	12.9	4.1	3.2	-	2.0	-	0.4	0.8			45.0
26.3	17.2	7.2	2.8	0.2	2.8	1	0.5	0.8		1.40	55.6
23.8				0.3	3.0	1	1.0	1.2			53.8
18.6				0.4	2.7	2	1.5	1.2		1.34	44.4
13.3				0.5	2.1	3	2.8	1.2		1.40	31.2
13.3				0.8	2.0	5	4.6	1.1			26.3

a. Few $CaCO_3$ concr.

b. Few smooth black coher (Fe-Mn) also few $CaCO_3$ concr

Soil type: Rosebud silt loam, deep
Location: Kimball County, Nebraska. 420 feet N and 0.15 mile E of SW corner, Sec. 9, T13N, R53W. About 9 miles S and 4 miles E of Dix, Nebraska.
Topography: About 1 percent southwest facing slope on a gently undulating loess-covered Tertiary plain.
Cultivated: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-1-(1-8)
Lincoln

Lab.No.	Horizon	
5795	A1p	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak fine granular structure; very friable, moist; abrupt smooth lower boundary.
5796	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; friable, moist; clear smooth lower boundary.
5797	B1	8-11 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) light silty clay loam; compound prismatic and weak medium subangular blocky structure; firm, moist; abrupt smooth lower boundary. Broken clay skins on both vertical and horizontal faces.
5798	B2	11-20 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins in both vertical and horizontal faces.
5799	B3ca	20-23 inches. Light brownish gray (10YR 6/2.5 dry) to grayish brown (10YR 5/2.5 moist) light silty clay loam; weak coarse subangular blocky; friable, moist; strong effervescence; clear smooth lower boundary.
5800	C1	23-28 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2.5 moist) silt loam; weak medium subangular blocky structure; friable, moist; violent effervescence, disseminated lime present in root channels and along structural faces; clear smooth lower boundary.
5801	D1	28-34 inches. Light gray (10YR 7/2 dry) to brown (10YR 5.5/3 moist) fine sandy loam; massive structure; friable, moist; violent effervescence; disseminated lime present in root channels.
5802	D2	34-45 inches. Pink (7.5YR 7/4 dry) to yellowish brown (10YR 5/4 moist) weathered Tertiary silts with high proportion of granitic gravel and sandy limestone fragments.

Note: Krotovinas 1-2 inches in diameter present through all horizons that are with dark colored material from surface horizons. Horizons A1p, B2 and C1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud loam, deep **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-2-(1-7) **LAB. NOS.** 5803-5809

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 >2 <2mm	TEXTURAL CLASS
0-6	A1p	8.4	10.2a	6.9a	9.2a	16.3a	33.0	16.0	41.7	11.9	3	fsl
6-10	B1	8.1	11.8a	7.2a	9.0a	13.3a	30.0	20.6	36.3	11.2	2	l
10-20	B2	3.2	7.6a	5.6a	8.3a	16.4a	33.4	25.5	42.1	11.8	Tr.	l
20-23	B3ca	1.4	5.7a	4.8a	9.2a	19.6a	35.1	24.2	47.2	12.5	-	l
23-30	C1	1.4b	5.6c	5.5c	11.8c	22.7c	32.6	20.4	49.6	12.1	Tr.	l
30-37	D1	4.9b	13.2c	9.8c	15.8c	19.6c	23.0	13.7	41.9	8.6	2	fsl
37-45	D2	45.2b	31.8c	6.3c	3.3c	1.2c	1.9	10.3	3.3	1.0	20	lcos

pH 8C1b Saturated Paste	pH 8C1a 1:1	pH 8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	ORGANIC MATTER 6B1a NITROGEN %	C/N	8A2 EST'D SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	GYPSUM mo./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
7.3	7.9	8.3	1.0c	.077	13.0	<0.20	0.9	-				7.6
6.9	7.7	7.9	0.52	.048	10.8	<0.20	0.7	-				9.8
6.9	7.5	8.0	0.53	.056	9.5	<0.20	0.6	-				11.6
7.6	8.3	8.9	0.62	.068	9.1	<0.20	0.8	5				11.7
7.7	8.5	9.2	0.33	.030	11.0	<0.20	0.8	12				10.7
7.8	8.7	9.4	0.16			<0.20	0.8	8				6.9
8.0	8.8	9.3	0.07			<0.20	1.0	7				5.7

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6G2b Mg	6H1a H	6P2a Na	6Q2a K	5D2 EXCH. Na %	8A1 SATURATION EXTRACT SOL. 6P1a Na	6Q1a K	4A3a Vol Wt g/cc	5A MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil	→					← milliequivalents per liter →			
15.5	13.6	1.3	1.6	-	1.6	-	0.2	1.2		32.2
16.9	12.7	2.8	2.4	-	1.3	-	0.2	0.6		37.1
21.2	14.6	4.6	3.2	0.1	1.8	-	0.4	0.7	1.45	46.3
20.2				0.1	2.1	-	0.5	1.0		45.3
15.2				0.2	2.0	1	0.9	1.2	1.45	39.4
11.2				0.4	1.8	3	2.3	1.3		27.9
8.9				0.4	1.4	3	3.6	1.4	1.51	22.9

a. Few smooth black concr. (Fe-Mn).
b. Few $CaCO_3$ concr.
c. Few $CaCO_3$ concr., also few smooth black concr. (Fe-Mn).

Soil type: Rosebud loam, deep
Location: Kimball County, Nebraska. 0.23 mile N of SE corner, Sec. 27, T14N, R54W, and 75 feet NW 4th light pole N, SE corner Sec. 27, T14N, R54W. About 6 miles south of Dix, Nebraska.
Topography: About 1 percent very gentle north facing slope on a gently undulating loess-covered Tertiary plain.

[redacted]

Cultivated: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-2-(1-7)
Lincoln

Lab.No.	Horizon	
5803	A1p	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable moist; abrupt smooth lower boundary.
5804	B1	6-10 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak coarse subangular blocky structure; friable, moist; clear smooth lower boundary; broken clay skins present on vertical faces.
5805	B2	10-20 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2.5 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins on both vertical and horizontal faces.
5806	B3ca	20-23 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) heavy silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; friable, [redacted]

[redacted]

5807	C1	23-30 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2 moist) silt loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; disseminated lime present in root channels and on face of aggregates.
5808	D1	30-37 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) fine sandy loam; massive structure; very friable, moist; violent effervescence; abrupt wavy lower boundary.
5809	D2	37-45 inches. Pink (7.5YR 7/4 dry) to light brown (7.5YR 6/4 moist) weathered Tertiary silts with high proportion of granitic gravel and limy sandstone fragments.

Note: Few coarse sand and fine gravels present throughout profile. Horizons A1p, B2 and C1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud silt loam, moderately deep **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-5-(1-7) **LAB. NOS.** 5828-5833

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE	COARSE	MEDIUM	FINE	VERY FINE					2A2 TEXTURAL CLASS

Soil type: Rosebud silt loam, moderately deep
Location: Kimball County, Nebraska. 720 feet east and 135 feet north of S1/4 corner Sec. 4, T13N, R55W. About 8 miles south and 1.5 miles east of Kimball, Nebraska.
Topography: About 1 percent slope in a gently undulating loess-covered weathered Tertiary plain.
Cultivated: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-5-(1-7)
Lincoln

Lab.No.	Horizon	
5828	A1p	0-4 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5829	B	4-11 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3.5/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; numerous 10YR 3/2 moist worm casts about 5 mm. in diameter. Continuous clay skins on vertical faces. Broken clay skins on horizontal faces.
5830	Bca	11-15 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse subangular blocky and weak medium subangular blocky structure; very friable, moist; violent effervescence; clear smooth lower boundary; few small gravels present.
5831	C	15-19 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam; weak coarse subangular blocky; very friable, moist; violent effervescence; clear smooth lower boundary.
5832	D1	19-23 inches. Very pale brown (10YR 7/3 dry) to light yellowish brown (10YR 6/4 moist) sandy loam; massive structure; very friable, moist; violent effervescence; gradual smooth lower boundary; scattered lime-covered gravels and sandstone fragments.
5833	D2	23-30 inches. Very pale brown (10YR 7/3 dry) to light yellowish brown (10YR 6/4 moist) gravelly sandy loam; massive structure; violent effervescence; abrupt smooth lower boundary. Horizon consists of considerable lime-covered gravels and calcareous sandstone fragments. Ten percent of horizon consists of gravels over 3/4 inch in diameter.
	D3	Semiconsolidated Tertiary.

Note: Horizons A1p, B and D1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud loam, mod. deep LOCATION Kimball County, Nebraska

SOIL NOS. S57Nebr-53-6-(1-4) LAB. NOS. 5834-5836

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1								2A2	TEXTURAL CLASS
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			

Soil type: Rosebud loam, moderately deep
Location: Kimball County, Nebraska. 0.35 mile east SW corner (100 feet north center of road and 35 feet east of

Topography: Three to four percent south facing slope in weathered Tertiary sands and silts on the Tertiary plains.
Cultivated: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-6-(1-4)
Lincoln

Lab.No.	Horizon	
5834	A1p	0-7 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5835	Bca	7-15 inches. Light gray (10YR 7/2 dry) to grayish brown (10YR 5/2 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; clear smooth lower boundary; few worm casts present; broken clay skins on vertical faces.
5836	C1	15-26 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) loam; weak coarse subangular blocky structure; very friable, moist; violent effervescence; abrupt wavy lower boundary. Several Krotovinas present, filled with dark colored material of surface horizons.
	Dr	26+ inches. Semiconsolidated Tertiary consisting of lime-coated sandstone fragments ranging from 5-mm. to 10-12 inches in diameter with a loamy sand 7.5YR 6/6 moist, matrix. The upper 2-3 inches of this horizon has the fragments coated with thick layers of lime.

Note: Tertiary fragments present throughout profile, being much more numerous in lower horizons. Range in size from 3 to 15-mm. Horizons A1p, Bca and C1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud loam, mod. deep **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-7-(1-5) **LAB. NOS.** 5837-5841

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 5A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-6	A1p	4.5a	9.7a	9.0a	12.3a	13.6a	33.4	17.5	44.0	9.7	3	l
6-10	A12	4.2a	10.1a	8.0a	11.7a	16.0a	31.2	18.8	41.4	11.2	2	l
10-16	Bca	2.8b	5.6b	4.2b	6.1b	10.7b	38.7	31.9	34.8	17.5	1	cl
16-28	C1	4.1b	8.7b	6.6b	9.5b	13.4b	33.2	24.5	36.1	15.1	2	l
28-34	D	19.3b	16.9b	9.7b	13.3b	14.0b	18.3	8.5	29.8	9.0	1	cosl

Soil type: Rosebud loam, moderately deep
Location: Kimball County, Nebraska. 0.1 mile west and 120 feet north of SE corner Sec. 35, T13N, R54W. About 13 miles south and 1 mile east of Dix, Nebraska.
Topography: About a 2 percent south facing slope in weathered Tertiary sands and silts on the Tertiary plains.
Cultivation: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: 857Nebr-53-7-(1-5)
Lincoln

Lab.No.	Horizon	
5837	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak fine granular; very friable, moist; slight effervescence; abrupt smooth lower boundary; this horizon appears to be overblow.
5838	A12	6-10 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; very friable moist; slight effervescence; abrupt smooth lower boundary.
5839	Bca	10-16 inches. Light grayish brown (10YR 6/2 moist) to dark grayish brown (10YR 4/2 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; clear wavy lower boundary.
5840	C1	16-28 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; gradual smooth lower boundary.
5841	D*	28-34 inches. Friable Tertiary material consisting of lime-covered sandstone fragments ranging

[redacted]

also present.

Note: Small Tertiary fragments scattered throughout profile being more abundant in lower horizons. Several Krotovinas present down through profile filled with darker colored material from surface horizons. Horizons Alp, Bca and C1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud silt loam, moderat ly deep **LOCATION** Kimball County, Nebraska

SOIL NOS. S57Nebr-53-10-(1-5) **LAB. NOS.** 5850-5854

PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)

DEPTH INCHES	HORIZON	1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-4	A1p	0.6	5.0	5.7	10.0	16.9	37.8	24.0	45.8	14.2	Tr.	l
4-12	B2	0.2	1.5	1.9	4.6	14.0	39.9	37.9	42.1	14.6	-	cl
12-15	Bca	0.2a	0.8a	1.6a	5.2a	15.5a	42.6	34.1	43.8	17.5	-	cl
15-22	C1	0.4a	2.8a	5.5a	13.1a	20.7a	34.3	23.2	48.3	14.0	-	l
22-28	IIl	8.1a	18.3a	15.7a	18.9a	11.5a	11.8	15.7	26.3	5.6	24	cosl

8C1b SATURATED	pH 8C1a	8C1a	ORGANIC MATTER 6A1a ORGANIC	6B1a NITRO-	8A2 EST% SALT (BUREAU	ELECTRICAL CONDUCTIVITY EC x10³	6E1a $CaCO_3$ equiv.	GYPSUM me./100g.	MOISTURE TENSIONS 1/10	1/3	4B2 15

Soil type: Rosebud silt loam, moderately deep
Location: Kimball County, Nebraska. 330 feet east and 60 feet north SW corner Sec. 30, T13N, R56W. About 12 miles south and 7 miles west of Kimball, Nebraska.
Topography: About a 1 percent slope on a nearly level loess-covered Tertiary plain.
Cultivation: Fallow, 1957.
Described by: Ross D. Greenawalt and Bill McKinzie.
Soil No.: S57Nebr-53-10-(1-5)
Lincoln

Lab.No.	Horizon	
5850	A1p	0-4 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2.5 moist) silt loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5851	B2	4-12 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; abrupt smooth lower boundary; 5-mm. worm casts present, filled with dark colored surface soil. Continuous clay skins on both vertical and horizontal faces.
5852	Bca	12-15 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse prismatic and weak fine and medium subangular blocky structure; friable, moist; violent effervescence; clear smooth lower boundary.
5853	C1	15-22 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2 moist) silt loam; weak coarse subangular blocky structure; very friable moist; violent effervescence; gradual smooth lower boundary; few Tertiary fragments and small pockets, coarse sand found in horizon.
5854	D1	22-28 inches. Very pale brown (10YR 7/3 dry) to light yellowish brown (10YR 6/4 moist) silt loam; massive structure; very friable moist; violent effervescence; abrupt wavy lower boundary. Horizon consists of limestone and lime-covered gravels. Consists of 60 percent fragments over 3/4 inch in diameter.
	D2	28+ inches. Semiconsolidated Tertiary with lenses and pockets of coarse sand.

Note: The surface 22 inches appears to be loessial material. Horizons A1p, B2 and C1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/20/55

SOIL TYPE Sharpsburg silty clay loam **LOCATION** Cass County, Nebraska

SOIL NOS. S54Nebr-13-2-(1-8) **LAB. NOS.** 2218-2225

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	A1p	-	0.1	0.1	0.2	1.9	70.3	27.4	45.8	26.5	-	sicl
6-11	A12	-	-	0.1	0.1	2.3	65.1	32.4	40.2	27.2	-	sicl
11-14	A3	-	0.1	0.1	0.1	1.7	61.9	36.1	36.0	27.7	-	sicl
14-21	B1	-	0.1	0.1	0.1	1.4	59.2	39.1	34.5	26.2	-	sicl
21-30	B21	-	-	0.1	0.1	1.7	56.6	41.5	31.8	26.5	-	sic
30-45	B22	-	-	0.1	0.2	2.5	60.4	36.8	35.8	27.1	-	sicl
45-53	B3	-	-	0.1	0.2	2.0	63.9	33.8	36.8	29.1	-	sicl
53-60	C	-	0.1	0.2	0.2	1.8	64.7	33.0	35.8	30.9	-	sicl

	pH		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY EC x 10^3 MILLIMHOS PER CM	6E1a		MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6H1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)		$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
5.2	5.8	5.9	1.79	.154	11.6			-				10.9
5.3	5.9	6.0	1.77	.154	11.5			-				13.3
5.4	6.0	6.2	1.51	.140	10.8			-				15.1

Soil type: Sharpsburg silty clay loam
Soil No.: S54Nebr-13-2-(1-8)
Location: .3 mile west and 200 feet north of southeast corner Sec. 30, T11N, R10E; 1 mile north and 2-3/4 miles east of Alvo, Cass County, Nebraska.
Topography: 3 percent west facing slope in gently rolling loess-mantled till plain.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2218	A_{1p}	0-6"	Dark grayish brown (10YR 4.5/2, dry) to very dark brown (10YR 2/2, moist) silty clay loam; moderate very fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
2219	A_{12}	6-11"	Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2/1.5, moist) silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
2220	A_3	11-14"	Dark grayish brown (10YR 3.5/2, dry) to very dark brown (10YR 2.5/2, moist) heavy silty clay loam; weak coarse blocky separating to moderate to strong fine granular or very fine subangular blocky structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
2221	B_1	14-21"	Brown (10YR 4/3, dry) to dark brown (10YR 3/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and coarse blocky and strong very fine subangular blocky; hard, dry; firm, moist; gradual smooth lower boundary.
2222	B_{21}	21-30"	Brown (10YR 5/3, dry; 4/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and [illegible]

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/20/55

SOIL TYPE Shamsburg silty clay loam **LOCATION** Cass County, Nebraska

SOIL NOS. S54Nebr-13-1-(1-8) **LAB. NOS.** 2210-2217

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		1B1b VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-5	A1p	0.1	0.2	0.1	0.4	2.9	65.9	30.4	44.1	24.9	-	sicl
5-10	A11	-	-	0.1	0.2	2.1	62.1	35.5	38.8	25.5	-	sicl
10-13	A3	-	-	0.1	0.2	1.8	58.4	39.5	34.4	26.0	-	sicl
13-18	B1	-	-	-	0.1	1.3	57.0	41.6	32.4	25.9	-	sic
18-28	B21	-	-	-	0.1	1.8	55.5	42.6	29.2	28.1	-	sic
28-40	B22	-	-	-	0.2	1.9	60.7	37.2	34.7	28.0	-	sicl
40-51	B3	-	-	-	0.1	1.7	63.2	35.0	35.1	29.8	-	sicl
51-60	C	-	0.1	0.1	0.2	2.1	64.5	33.0	36.3	30.4	-	sicl

	pH		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY	6K1a		MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6N1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC x 10³ MILLIMHOS PER CM	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
5.3	6.1	6.2	2.15	.180	11.9			-				12.4
5.4	6.0	6.2	2.04	.170	12.0			-				14.8
5.4	5.8	6.2	1.71	.146	11.7			-				16.6
5.5	6.1	6.4	1.32	.132	10.0			-				17.6
5.6	6.1	6.6	0.73	.067	10.9			-				18.1
5.9	6.2	6.8	0.34					-				16.8
6.0	6.9	6.9	0.19					-				16.3
6.0	7.1	7.1	0.14					-				15.8

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %			5A3a Sum Cations	6D3	MOISTURE AT SATURATION
	6N2b Ca	6Q2b Mg	H	6P2a Na	6Q2a K	5C1	Na	K	me/100g.	Ca/Mg	%
	← milliequivalents per 100g. soil →										
23.6	13.2	4.6		0.1	1.4	82			19.3	2.9	
26.2	15.2	5.6		0.1	0.7	82			21.6	2.7	
28.0	16.9	6.7		0.1	0.5	86			24.2	2.5	
28.0	17.2	7.8		0.1	0.4	91			25.5	2.2	
29.5	18.6	9.0		0.1	0.5	96			28.2	2.1	
27.9	17.8	8.9		0.2	0.5	98			27.4	2.0	
27.6	18.0	9.1		0.3	0.5	100			27.9	2.0	
27.4	17.5	8.9		0.3	0.5	99			27.2	2.0	

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Sharpsburg silty clay loam
Soil No.: S54Nebr-13-1-(1-8)
Location: 500 feet south of east quarter corner Sec. 18, T10N, R11E; 4 miles east and .5 mile south of Elmwood, Cass County, Nebraska.
Topography: About 3 percent west facing slope in gently rolling landscape.
Land use: Cultivated, corn 1954.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2210	A_{1p}	0-5"	Dark grayish brown (10YR 4/1.5, dry) to very dark brown (10YR 2/2, moist) silty clay loam; moderate fine and very fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
2211	A_{11}	5-10"	Dark gray (10YR 3.5/1, dry) to very dark brown or black (10YR 2/1.5, moist) silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
2212	A_3	10-13"	Dark grayish brown (10YR 3.5/2, dry) to very dark brown (10YR 2.5/2, moist) heavy silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
2213	B_1	13-18"	Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 3/2, moist) heavy silty clay loam; compound weak [illegible] and strong very fine subangular [illegible] black crack filling around the coarse prisms; gradual wavy lower boundary.
2214	B_{21}	18-28"	Brown (10YR 5/2.5, dry) to dark brown (10YR 3/3, moist) heavy silty clay loam or silty clay; compound strong

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SOIL TYPE Sharpsburg silty clay loam **LOCATION** Saunders County, Nebraska

SOIL NOS. S58Nebr-78-3-(1-11) **LAB. NOS.** 8430-8440

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-8	A1p	0.1a	0.1a	0.1a	0.2a	4.7a	62.0	32.8	44.8	22.0	-	sicl
8-12	B1	<0.1	<0.1	<0.1	<0.1	3.5a	52.1	44.4	35.3	20.3	-	sic
12-19	B21	<0.1	<0.1	<0.1	0.1a	4.1a	54.9	40.9	38.9	20.2	-	sic
19-30	B22	<0.1	<0.1	<0.1	0.2a	4.6a	59.0	36.2	41.6	22.2	-	sicl

Soil type: Sharpsburg silty clay loam
Soil No.: S58Nebr-78-3-(1-11)
Location: .1 mile west and 100 feet north of the southeast corner Sec. 5, T15N, R6E; approximately 2 miles north and 2 miles west of Malmo, Saunders County, Nebraska.
Physiography: Dissected loess-mantled till plain.
Relief: 50 to 60 feet.
Slope: 2 percent smooth south facing convex slope.
Parent material: Peorian loess.
Erosion: Slight to moderate.
Drainage: Well.
Permeability: Moderately slow.
Land use: Corn 1958. Described by: W. E. McKinzie and J. A. Elder.

Horizon and Lincoln Lab. Number	
Alp 8430	0 to 8 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) silty clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
B1 8431	8 to 12 inches. Dark brown (10YR 3/3 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam; strong fine subangular blocky; firm, moist; no effervescence; organic staining along aggregates and thin patchy clay skins on aggregates; clear smooth boundary.
B21 8432	12 to 19 inches. Dark brown (10YR 4/3 moist) to brown (10YR 5/3 dry) silty clay loam; moderate medium prismatic to strong fine subangular blocks; firm, moist; no effervescence; thin continuous clay skins on aggregates; gradual smooth boundary.
B22 8433	19 to 30 inches. Dark grayish brown (10YR 4/2 moist) to yellowish brown (10YR 5/4 dry) silty clay loam; moderate medium prismatic to moderate fine and medium blocky; firm, moist; no effervescence; thin continuous clay skins on aggregates; gradual smooth boundary.
B23 8434	30 to 40 inches. Dark grayish brown (10YR 4/2 moist) to pale brown (10YR 6/3 dry) silty clay loam; moderate medium prismatic to moderate fine and medium blocky; friable, moist; no effervescence; few fine faint gray and yellowish brown mottles; clear smooth boundary.
B3 8435	40 to 45 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; friable, moist; no effervescence; common fine distinct gray mottles; gradual smooth boundary.
C1 8436	45 to 54 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; friable, moist; no effervescence; common medium distinct gray mottlings and few medium faint yellowish brown mottles; gradual smooth boundary.
C2 8437	54 to 60 inches. Olive brown (2.5Y 4/4 moist) to light yellowish brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common medium faint yellowish brown and gray mottles; scattered iron and manganese concretions.
C3 8438	60 to 72 inches. Olive brown (2.5Y 4/4 moist) to light grayish-brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common medium fine yellowish brown and gray mottles; few dark brown iron and manganese concretions; gradual smooth boundary.
C4 8439	72 to 96 inches. Light olive brown (2.5Y 5/4 moist) to pale yellow (2.5Y 7/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common medium fine yellowish brown and gray mottles; few dark brown iron and manganese concretions; gradual smooth boundary.

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SOIL TYPE Sharpsburg silty clay loam LOCATION Saunders County, Nebraska

SOIL NOS. S58Nebr-78-6-(1-11) LAB. NOS. 8457-8467

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	<0.1	0.1a	0.1a	0.3a	6.0b	63.7	29.8	46.5	23.4	-	sicl
6-10	B1	0.1a	0.2a	0.1a	0.1a	4.4b	57.2	37.9	38.1	23.5	-	sicl
10-18	B21	<0.1	0.2a	0.2a	0.3a	4.3b	53.6	41.4	34.0	24.0	-	sic
18-27	B22	0.1a	0.1a	0.1a	0.3a	6.1b	57.1	36.2	42.3	21.0	-	sicl
27-32	B3	<0.1	0.1a	0.1a	0.3a	8.0b	58.1	33.4	46.0	20.3	-	sicl
32-40	C1	<0.1	0.1a	0.1a	0.4a	8.3b	59.2	31.9	46.4	21.3	-	sicl
40-50	C2	0.1a	0.1a	0.1a	0.5a	7.2b	59.6	32.4	45.1	22.1	-	sicl
50-60	C3	<0.1	0.1a	0.1a	0.5a	5.7b	62.6	31.0	43.6	25.0	-	sicl
60-84	C4	0.1a	0.2a	0.2a	0.5a	7.0b	64.2	27.8	49.8	21.7	-	sicl
84-93	C5	<0.1	0.4a	0.4a	0.8a	6.5b	65.4	26.5	47.6	24.8	-	sil

	pH		ORGANIC MATTER				6E1a			MOISTURE TENSIONS		
8C1a 1:1	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	ELECTRICAL CONDUCTIVITY EC x 10³ MILLIMHOS PER CM 8A1a	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
---	---	---	---	---	---	---	---	---	---	---	---
5.8			1.54	0.165	9.3	0.4					11.8
5.8			1.24	0.113	11.0	0.4					15.2
6.1			0.69	0.061	11	0.4					16.7
6.2			0.34	0.043	7	0.4					15.3
6.2			0.26			0.4					14.5
6.4			0.21			0.3					14.4
6.5			0.13			0.5					15.1
6.6			0.12			0.5	<1				14.7
6.9			0.09			0.4	<1				13.6
7.0			0.08			0.4	<1				14.4

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	BASE SAT. % NH_4Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	5B1a Sum Bases	5A3a Sum Cations	8D3 Ca/Mg		8A MOISTURE AT SATURATION %
← milliequivalents per 100g. soil →								← me/100 g →				
20.3	11.8	4.1	7.7	<0.1	1.4	85	69	17.3	25.0	2.9		51.2
24.3	14.8	6.0	7.4	<0.1	0.8	89	74	21.6	29.0	2.5		60.1
27.1	17.0	7.5	6.2	0.1	0.7	93	80	25.3	31.5	2.3		66.5
25.0	16.5	7.3	5.0	0.1	0.7	98	83	24.6	29.6	2.3		63.6
23.7	16.1	6.8	4.5	0.1	0.7	100	84	23.7	28.2	2.4		65.9
23.8	16.1	6.8	3.7	0.2	0.7	100	86	23.8	27.5	2.4		71.3

Soil type: Sharpsburg silty clay loam
Soil No.: S58Nebr-78-6-(1-11)
Location: .2 mile north and 50 feet east of west quarter corner Sec. 17, T16N, R6E (east fourth light pole south of transformer pole); approximately 5 miles south of Morse Bluff, Saunders County, Nebraska.
Physiography: Dissected loess-mantled till plain.
Relief: 40 to 60 feet.
Slope: 2 percent smooth south-southwest facing convex slope.
Parent material: Peorian loess.
Erosion: Slight to moderate.
Drainage: Well.
Permeability: Moderately slow.
Land use: Corn 1958. Described by: W. E. McKinzie and J. A. Elder

Horizon and Lincoln Lab. Number	
Alp 8457	0 to 6 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) light silty clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
B1 8458	6 to 10 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam; weak coarse subangular blocky to moderate fine subangular blocky; friable, moist; no effervescence; clear smooth boundary.
B21 8459	10 to 18 inches. Dark brown (10YR 4/3 moist) to brown (10YR 5/3 dry) silty clay loam; weak coarse subangular blocky to moderate medium subangular blocky; firm, moist; no effervescence; thin continuous clay skins on aggregates; gradual smooth boundary.
B22 8460	18 to 27 inches. Dark grayish brown (10YR 4/2 moist) to brown (10YR 5/3 dry) silty clay loam; moderate medium prismatic to moderate fine and medium blocky; slightly plastic, wet; no effervescence; thin continuous clay skins on aggregates; few fine faint dark brown mottles; gradual smooth boundary.
B3 8461	27 to 32 inches. Dark grayish brown (10YR 4/2 moist) to brown (10YR 5/3 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; slightly plastic, wet; no effervescence; thin patchy clay skins; few faint fine yellowish brown mottles; clear smooth boundary.
C1 8462	32 to 40 inches. Dark grayish brown (2.5Y 4/2 moist) to grayish brown (2.5Y 5/2 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; friable, moist; no effervescence; common fine and medium distinct yellowish brown mottles with scattered dark brown iron and manganese concretions; gradual smooth boundary.
C2 8463	40 to 50 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) light silty clay loam; weak coarse prismatic; friable, moist; no effervescence; common fine and medium distinct yellowish brown mottles with scattered dark brown iron and manganese concretions; gradual smooth boundary.
C3 8464	50 to 60 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) light silty clay loam; weak coarse prismatic; friable, moist; no effervescence; common fine and medium distinct yellowish brown mottles with scattered dark brown iron and manganese concretions.
C4 8465	60 to 84 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common fine distinct gray and yellowish brown mottles with higher percentage of gray mottles; gradual smooth boundary.
C5 8466	84 to 93 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common fine distinct gray and yellowish brown mottles with a high percentage of mottling being yellowish brown; gradual smooth boundary.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Sharpsburg **LOCATION** Washington County, Nebraska

SOIL NOS. S57Nebr-89-4-(1-7) **LAB. NOS.** 6278-6284

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-5	A1p	-	0.1a	-	-	1.5	66.5	31.9	38.8	29.2	-	sicl
5-12	A12	0.2b	0.2b	0.1b	0.1b	1.1b	64.7	33.6	36.4	29.5	-	sicl
12-16	B1	0.3b	0.3b	0.2b	0.2b	0.9b	62.2	35.9	27.5	35.7	-	sicl
16-24	B21	0.2b	0.3b	0.2b	0.2b	1.1b	60.0	38.0	31.4	29.8	-	sicl
24-36	B22	-	0.3b	0.2b	0.3b	2.1b	61.1	36.0	36.1	27.3	-	sicl
36-48	B3	-	0.1b	0.2b	0.3b	2.6b	62.6	34.2	38.2	27.2	-	sicl
48-60	C	-	0.1b	0.1b	0.2b	3.0b	65.1	31.5	42.4	25.8	-	sicl

8C1a pH 1:1	pH 1:5	pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
5.8			2.14	.193	11.1							12.6
6.1			2.11	.188	11.2							14.0
6.5			1.47	.136	10.8							15.4
6.6			0.91	.088	10.3							15.3
6.7			0.48									10.4
6.7			0.26									10.2
6.8			0.18					-				13.2

5A1a CATION EXCHANGE	EXTRACTABLE CATIONS 6N2b	6O2b	6H1a	6P2a	5B1a 6Q2a	BASE SAT. NH₄Ac	Base Sat. %	5B1a Sum	5A3a Sum		Vol. Wt.	

Soil type: Sharpsburg silt loam
Soil No.: S57Nebr-89-4-(1-7)
Location: 350 feet north and 100 feet west of southeast corner of southwest quarter Sec. 28, T19N, R10W, Washington County, Nebraska.
Physiography: Nearly level loess plain.
Relief: 2 to 6 feet.
Slope: Level, less than 1 percent.
Parent material: Peorian loess.
Drainage: Moderately well.
Permeability: Moderately slow.
Land use: Cultivated, wheat 1957. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number	
Alp 6278	0 to 5 inches. Very dark brown (10YR 2/2 moist) to dark grayish brown (10YR 4/1.5 dry) heavy silt loam; weak subangular blocky clods breaking to moderate very fine granules; friable, moist; slightly hard, dry; abundant roots; no effervescence; abrupt smooth boundary.
A12 6279	5 to 12 inches. Very dark brown (10YR 2/1.5 moist) to dark grayish brown (10YR 3.5/2 dry) light silty clay loam which crushes to 10YR 3/3 moist. Moderate fine granular; friable, moist; slightly hard, dry; abundant roots; many very fine pores and numerous worm casts; an occasional 1/8-inch iron-manganese shot-like concretion; no effervescence; clear smooth boundary.
B1 6280	12 to 16 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam which crushes to dark brown (10YR 3/3 moist); weak medium subangular blocky breaking to moderate fine granular; patchy coating on aggregates; roots plentiful, few worm casts; no effervescence; few 1/16- to 1/8-inch very dark brown shot-like concretions; clear smooth boundary.
B21 6281	16 to 24 inches. Very dark brown (10YR 3.5/3 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam crushing to 10YR 4/3, moist; weak medium subangular blocky breaking to moderate fine granular; slightly firm, moist; hard, dry; roots plentiful, few very fine pores; an occasional 1/16-inch very dark brown shot-like concretion; no effervescence; clear smooth boundary.
B22 6282	24 to 36 inches. Dark grayish brown (10YR 4/2.5 moist) to grayish brown (10YR 5/2.5 dry) silty clay loam; weak coarse prismatic breaking to moderate fine subangular blocky; slightly firm, moist; hard, dry; aggregate coatings thin and continuous; some dark-colored thick coatings on faces of prisms; roots common but tend to follow faces of subangular blocks; few faint fine yellowish brown mottles; no effervescence; gradual smooth boundary.
B3 6283	36 to 48 inches. Dark grayish brown (2.5Y 4/2 moist) to grayish brown (2.5Y 5.5/2 dry) silty clay loam. Weak coarse prismatic breaking to weak medium and fine subangular blocky; friable, moist; slightly hard, dry; few roots, many fine and very fine pores; common distinct fine yellowish brown mottles; a few prominent very dark brown soft iron-manganese concretions; no effervescence; gradual smooth boundary.
C 6284	48 to 60 inches. Grayish brown (2.5Y 5/2.5 moist) to grayish brown (2.5Y 5.5/2 dry) silty clay loam. Weak coarse prismatic breaking to weak subangular blocks; very friable, moist; soft, dry; numerous fine and very fine pores; common distinct fine yellowish brown mottles; a few fine prominent very dark brown soft iron-manganese concretions; no roots; no effervescence.

Horizons A12, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

OIL TYPE Sharpsburg silt loam **LOCATION** Washington County, Nebraska

SOIL NOS. S57Nebr-89-6-(1-7) **LAB. NOS.** 6292-6298

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	A1p	-	0.1	0.1a	0.1a	1.7a	66.5	31.5	40.9	27.4	-	sicl
6-12	A12	0.1	0.1	-	-	1.6a	65.4	32.8	40.8	26.2	-	sicl
12-17	A3	-	-	0.2b	0.2b	1.3b	63.2	35.1	37.0	27.6	-	sicl
17-25	B21	0.1	0.2	0.1b	0.2b	1.1b	61.0	37.3	34.6	27.6	-	sicl

Soil type: Sharpsburg silt loam
Soil No.: S57Nebr-89-6-(1-7)
Location: 800 feet west and 75 feet north of center of Sec. 3, T17N, R10E, Washington County, Nebraska.
Physiography: Nearly level loess plain.
Relief: 2 to 6 feet.
Slope: Level, less than 1 percent.
Parent material: Peorian loess.
Drainage: Moderately well.
Permeability: Moderately slow.
Land use: Cultivated, oats 1957. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number

Alp 6292 — 0 to 6 inches. Very dark brown (10YR 2/1.5 moist) to very dark gray (10YR 3.5/1.5 dry) heavy silt loam; moderate medium subangular blocky clods breaking to moderate fine granular; friable, moist; slightly hard, dry; no effervescence; abrupt smooth boundary.

A12 6293 — 6 to 12 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 2.5/2 dry) silty clay loam; upper 3 inches is a compacted plow pan, sharp-angled blocks and thick plates; the lower 3 inches is moderate medium and fine subangular blocky breaking to moderate fine and very fine granular; friable, moist; slightly hard, dry; abundant fine roots, numerous very fine pores, few worm casts; no effervescence; clear smooth boundary.

A3 6294 — 12 to 17 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry), to 10YR 3/2 in lower part, silty clay loam; weak medium subangular blocky breaking to strong fine granular; friable, moist; slightly hard, dry; numerous fine and medium pores, numerous worm casts; no effervescence; crushes to 1/2 chip lighter and 1/2 chip browner; clear smooth boundary.

B21 6295 — 17 to 25 inches. Very dark grayish brown (10YR 3/2.5 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam, crushing to 10YR 4/3, moist; weak coarse prismatic breaking to moderate fine subangular blocky; slightly firm, moist; hard, dry; abundant roots, numerous fine and medium pores; aggregates have thin nearly continuous coatings; no effervescence; clear smooth boundary.

B22 6296 — 25 to 36 inches. Dark brown (10YR 3/3 moist) to brown (10YR 5/3 dry) silty clay loam, crushing to 10YR 4.5/3, moist; weak medium prismatic breaking to moderate medium and fine subangular blocky; slightly firm, moist; hard, dry; thin continuous coatings on aggregates; abundant roots, few worm casts of darker materials; few faint fine yellowish brown mottles; no effervescence; gradual smooth boundary.

B3 6297 — 36 to 45 inches. Olive brown (2.5Y 4/3 moist) to brown (10YR 5/3 dry) silty clay loam, crushing to slightly lighter color; moderate medium and fine prismatic breaking to moderate fine subangular blocky; slightly firm, moist; hard, dry; patchy thin coatings on aggregates; a few very fine roots, numerous fine and medium pores; fine medium common distinct yellowish brown mottles; no effervescence; gradual smooth boundary.

C 6298 — 45 to 60 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 5.5/2 dry) silty clay loam; weak coarse prismatic; very friable, moist; slightly hard, dry; many fine to medium pores, no roots; common distinct medium and fine yellowish brown mottles; few fine soft very dark brown iron-manganese concretions; no effervescence.

Note: Calcareous 65 to 84 inches; violent effervescence with few hard lime concretions. No effervescence 84 to 100 inches except in a few very fine pores and openings. Horizons A12, B22 and C sampled for Bureau of Public Roads.

OIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Sharpsburg silty clay loam LOCATION Washington County, Nebraska

SOIL NOS. S57Nebr-89-7-(1-7) LAB. NOS. 6299-6305

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE	COARSE	MEDIUM	FINE	VERY FINE				3A1	2A2	TEXTURAL CLASS

Soil type: Sharpsburg silty clay loam
Soil No.: S57Nebr-89-7-(1-7)
Location: 400 feet west and 100 feet south of northeast corner northwest quarter Sec. 3, T18N, R9E, Washington County, Nebraska.
Physiography: Ridge top in dissected loess plain.
Relief: 60 to 80 feet.
Slope: 1 percent, smooth slightly convex.
Parent material: Peorian loess.
Drainage: Well drained.
Permeability: Moderate.
Salt or alkali: Carbonates present at 120 plus inches as few fine soft white accumulations in pores and small openings.
Land use: Cultivated, wheat 1957. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and Lincoln Lab. Number	
Alp 6299	0 to 6 inches. Dark brown (10YR 2/1.5 moist) to very dark gray (10YR 4/1.5 dry) silty clay loam; weak subangular blocky clods breaking to moderate fine and very fine granular; friable, moist; slightly hard, dry; no effervescence; abrupt smooth boundary.
A12 6300	6 to 9 inches. Dark brown (10YR 2/1.5 moist) to very dark grayish brown (10YR 3.5/2 dry) silty clay loam; moderate medium subangular blocky and weak medium platy in compacted plow layer; friable, moist; [redacted] boundary.
B1 6301	9 to 14 inches. Very dark grayish brown (10YR 3/2.5 moist) to dark grayish brown (10YR 4/2.5 dry) silty clay loam crushing to 10YR 3.5/3, moist; moderate fine subangular blocky breaking to fine granular; friable, moist; hard, dry; abundant roots, numerous fine pores, few worm casts; no effervescence; clear smooth boundary.
B21 6302	14 to 20 inches. Dark brown (10YR 3/3 moist) to dark brown (10YR 4.5/3 dry) silty clay loam crushing to 10YR 4/3, moist; weak medium prismatic breaking to moderate medium and fine subangular blocky; slightly firm, moist; hard, dry; thin continuous coatings on aggregates; numerous medium and fine pores, few worm casts, abundant roots; no effervescence; clear smooth boundary.
B22 6303	20 to 30 inches. Dark brown (10YR 3.5/3 moist) to brown (10YR 5/3 dry) silty clay loam crushing to 10YR 4/3, moist; moderate medium and coarse prismatic breaking to moderate medium and fine subangular blocky; slightly firm, moist; hard, dry; thin continuous coatings on both large and small aggregates; abundant roots but most on faces of aggregates; a few fine soft very dark brown iron-manganese concretions; no effervescence; clear smooth boundary.
B23 6304	30 to 42 inches. Dark grayish brown (10YR 4/2.5 moist) to brown (5/3 dry) silty clay loam crushing to 10YR 4/3 moist; moderate coarse prismatic breaking to weak medium subangular blocky; slightly firm, [redacted]

1208-1214

SOIL SURVEY LABORATORY — Mandan, North Dakota

SOIL TYPE Silver Creek silt loam

SOIL NO. S52Nebr-10-1-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2	TEXTURAL CLASS
1208	0-5	A1p	0.2	0.3	0.5	1.3	11.8	59.2	26.7	15.9	56.0	—	sil
1209	5-10	A12	0.1	0.3	0.4	1.2	10.5	57.8	29.7	16.7	52.4	—	sicl
1210	10-15	B1	0.6	0.7	0.7	2.1	6.5	41.1	48.3	17.5	31.6	—	sic
1211	15-28	B21ca	1.0	1.4	1.4	4.4	7.9	41.2	42.7	17.3	35.0	—	sic
1212	28-37	B22	0.7	0.8	1.0	3.5	11.1	48.5	34.4	18.4	43.8	—	sicl
1213	37-45	Cg	0.1	1.1	2.0	7.4	13.5	36.4	39.5	15.4	39.7	—	cl
1214	45-52	D1	0.9	2.4	3.1	18.9	23.4	39.1	12.2	17.5	60.0	—	l

	pH			ORGANIC MATTER			8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUC. TIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS (per cent)		
	SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS. 4B2
	6.7	7.5	7.7	2.34			—	0.7	tr	—			14.4
	7.2	8.2	8.4	2.24			—	0.7	tr	—			16.8
	8.0	8.5	8.8	1.46			—	0.8	2	—			26.2
	7.9	8.6	8.9	0.87			0.27	4.2	4	—			22.1
	7.7	8.4	8.6	0.57			0.27	4.8	3	—			19.2
	7.8	8.3	8.6	1.05			0.25	4.1	17	4			20.6
	4.8	5.4	5.6	0.30			—	3.2	—	—			7.3

Soil Type: Silver Creek silt loam
Soil No.: S52Nebr-10-1-(1-8)
Date: September 1952
County: Buffalo County, Nebraska.
Location: Fifty feet east of W1/4 corner Sec. 23, T9N, R13W.
Described by: B. H. Williams.

Mandan Lab.No.	Horizon	
1208	A1p	0-5 inches. Very dark gray (10YR 3/1 moist) to dark gray (10YR 4/1 dry) fine granular silt loam; no free lime.
1209	A12	5-10 inches. Very dark gray (10YR 3/1 moist) to dark gray (10YR 4/1 dry) heavy silt loam or silty clay loam; macro blocky breakage but with moderate pressure breaks to medium and coarse granules; slightly calcareous with a few fine white spots of free lime carbonate.
1210	B1	10-15 inches. Black (10YR 2/1 moist) to dark gray (10YR 4/1 dry) silty clay; macro blocky, breaking easily to medium blocks and these in turn into coarse subangular granules; fairly abundant soft lime spots and seams; otherwise not appreciably calcareous.
1211	B21ca	15-28 inches. Very dark brown (10YR 2/2 moist) to gray (10YR 4.5/1 dry) silty clay; coarse blocky primary and fine subangular blocky-coarse granular secondary structure; calcareous including a great abundance of spots and streaks of free lime carbonate. When moderately moist the structure particles fall apart with only slight pressure; when wet the soil is sticky and plastic and hard when dry.
1212	B22	28-37 inches. Dark gray (10YR 4/1 moist) to gray (10YR 5/1 dry) heavy silty clay loam or silty clay medium blocky with some natural breakage to smaller blocks; consistence about as in horizon above and lime accumulation not so pronounced.
1213	Cg	37-45 inches. Gray and light gray marbled silty clay loam (moist) with some grayish brown seams and streaks and olive yellow and olive brown mottles; soft plastic and sticky at near saturated moisture condition when sampled; calcareous including some free lime spots and fairly abundant snail shells.
1214	D1	45-52 inches. Grayish brown (2.5Y 5/2 moist) to light gray (2.5Y 7/2 dry) fine sandy loam; massive; slightly sticky, wet; slightly calcareous. Numerous fine, some coarse, mottles; mainly yellow and yellowish brown colors.
--	D2	52-60+ inches. Loose coarse sand containing some fine gravel; basic color light gray; some fine brown and yellowish brown mottles; concentric mottles or staining around root channels, some of which are 1/4 inch in diameter and continuous through the depth of the horizon samples; no free lime carbonate; horizon below water table, in nonirrigated corn field.

Note: Collected from low terrace where soils were mapped Lamoure in the published Buffalo County Soil Survey Series 1924. The soil seems to fall within the range of Silver Creek soils first described and sampled in Hall County at a higher terrace level but in flat or slightly depressed areas. The lime carbonate horizon does not show quite as heavy lime concentration as in the soils of Hall County and there seems to be a little better blocky structure development in the Buffalo County soils of this kind in the general area of this sample location.

1215-1223

SOIL SURVEY LABORATORY
Mandan, North Dakota

SOIL TYPE Silver Creek silt loam

SOIL NO. S52Nebr-10-2-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2 (<19mm)	TEXTURAL CLASS
1215	0-5	A1p	0.1	0.3	0.6	1.8	16.4	60.4	20.4	14.3	63.7	-	sil
1216	5-9	A12	0.2	0.3	0.8	2.4	13.9	51.4	31.0	13.3	53.6	-	sicl
1217	9-13	B1	0.2	0.5	0.9	2.5	12.0	44.5	39.4	12.3	45.8	-	sicl
1218	13-19	B21	0.1	0.5	0.8	2.5	10.5	43.7	41.9	12.7	43.2	-	sic
1219	19-30	B22	0.7	0.8	1.2	4.1	11.8	42.8	38.6	15.5	41.8	Tr.	sicl
1220	30-34	A1b	0.1	1.0	2.2	8.5	18.0	45.2	25.0	13.5	55.5	-	l
1221	34-46	B1b	0.3	1.6	3.1	15.9	22.1	34.7	22.3	11.6	56.0	Tr.	l
1222	46-51	B3gb	-	0.3	1.0	15.7	33.2	32.8	17.0	13.1	66.7	-	l
1223	51-56	Cgb	0.1	0.5	1.9	26.6	46.3	17.0	7.6	5.8	79.5	-	vfsl

	pH			ORGANIC MATTER			8A2 EST. % SALT (BUREAU CUR)	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS (per cent)		
	SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS. 4B2
	8.0	8.9	9.1	1.53			-	1.0	2	-			11.0
	8.2	9.2	9.4	1.16			-	1.1	3	-			15.5
	8.3	9.1	9.2	0.86			-	1.1	17	-			17.8
	8.7	9.6	9.7	0.50			-	1.1	22	-			19.1
	8.8	9.8	9.9	0.31			-	1.3	23	-			17.7
	8.8	9.8	9.9	0.16			-	1.3	1	-			17.7
	8.8	9.7	9.9	0.12			-	1.4	10	-			16.3
	8.1	8.0	9.0	0.11			-	1.5	1	-			11.8
	5.4	5.5	5.7	0.31			-	4.0	1	-			6.5

	5A1a CATION EXCHANGE CAPACITY NH_4OAc	5B1a CATIONS EXTRACTABLE Ca	Mg 6O2b	5B1b EXCHANGEABLE Na 6P2a	K 6Q2a	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1 6P1a Na	6Q1a K	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
	milliequivalents per 100g soil						milliequivalents per liter						
	18.1			0.6	1.8	3	5.2	0.9					54.9
	19.7			2.2	1.8	11	8.3	0.5					71.6
	17.8			2.2	1.6	12	9.1	0.5					82.3
	16.8			3.0	1.7	18	10.2	0.2					103.4
	15.2			4.7	2.0	31	11.7	0.2					106.2
	19.0		9.3	6.9	2.5	36	12.8	0.2					103.0
	17.0			6.1	1.9	36	13.9	0.2					84.5
	15.3		5.4	5.3	1.5	35	14.3	0.2					64.1
	9.3		3.1	2.0	0.8	22	35.6	1.3					43.8

ARS-SCS-BELTSVILLE, MD 2002 JUNE 1955

Soil Type: Silver Creek silt loam
Soil No.: S52Nebr-10-2-(1-10)
Date: September 1952
County: Buffalo County, Nebraska.
Location: One-fourth mile west and 60 feet north of SE corner Sec. 24, T9N, R14W.
Described by: B. H. Williams.

Mandan Lab.No.	Horizon	
1215	A1p	0-5 inches. Dark gray (10YR 3.5/1 moist) to gray (10YR 5/1 dry) friable, granular silt loam; lime free in general but effervesces weakly with dilute HCl in parts of the field sampled.
1216	A12	5-9 inches. Very dark brown (10YR 2/2 moist) to gray (10YR 4.5/1 dry) granular heavy silt loam; slightly calcareous in lower part.
1217	B1	9-13 inches. Dark gray (10YR 4/1 moist) to gray (10YR 5/1 dry) blocky granular silty clay loam; friable, moist; sticky when wet; moderately hard when dry; slightly calcareous.
1218	B21	13-19 inches. Dark gray or dark grayish brown (10YR 4/1.5 moist) to gray (10YR 5/1 dry) blocky silty clay loam; friable, moist; moderately to strongly calcareous.
1219	B22	19-30 inches. Grayish brown (2.5Y 5/2 moist) to light gray (2.5Y 7/2 dry) weak blocky, friable, silty clay loam; very strongly calcareous, mainly disseminated lime; some concretions especially in the lower 2 inches where also there are numerous snail shells present.
1220	A1b	30-34 inches. Dark gray (2.5Y 4/1 moist) to light brownish gray (2.5Y 6/2 dry) silty clay; moderately compact, no well-defined structure except widely spaced horizontal cleavage planes that are stained with pale brown and partly coated with free lime carbonate; the horizon is not otherwise appreciably calcareous; sticky and plastic, moist. This is a weakly developed A of a buried soil or a dark sedimentary layer.
1221	B1b	34-46 inches. Dark gray (5Y 4.5/1 moist) to light olive gray (5Y 6/2 dry) sandy clay loam or sandy clay; aside from slightly lighter color, more fine sand and faint mottles, this layer does not appear different from the one next above; free lime mainly along structure planes.
1222	B3gb	46-51 inches. Light olive gray or pale olive (5Y 6/2.5 moist) to light gray (5Y 7/2 dry) loam. Aside from lighter color and coarser texture not appreciably different from the two horizons next above.
1223	Cgb	51-56 inches. Olive gray (5Y 5/2 moist) to light gray (5Y 7/2 dry) sticky sandy loam; massive except vertical cleavage; abundant mottlings staining, especially along root channels; no free lime.
--	D	56-60 inches. Medium and fine loose gray sand; rests on the water table in coarse sand.

SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Silver Creek silt loam

SOIL NO. S51Nebr-40-9-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2 (<19mm)	TEXTURAL CLASS
933	0-7	A1p	0.4	0.6	0.9	3.1	19.7	56.3	19.0	15.2	62.6	-	sil
934	7-12	A12	0.4	0.6	0.8	2.8	19.3	55.3	20.8	16.4	60.2	-	sil
935	12-17	B21	0.5	0.5	0.5	1.2	11.0	39.9	46.4	12.4	39.2	-	c
936	17-22	B22	1.3	0.8	0.6	1.2	9.6	41.8	44.7	14.2	37.9	2a	sic
937	22-30	B3	3.7	0.8	2.1	1.5	9.4	46.0	36.5	17.1	39.2	2a	sicl
938	30-40	C1	7.7	2.2	1.0	1.8	10.8	49.9	26.6	20.4	41.4	2a	l
939	40-55	C2	1.9	1.2	0.7	1.0	15.9	56.6	22.7	22.9	50.1	8a	sil
940	55-60	C3	0.5	0.5	0.4	1.0	18.4	57.8	21.4	22.7	54.1	6a	sil

LABORATORY NUMBER	pH SATURATED PASTE 8C1b	pH 1:5 8C1a	pH 1:10 8C1a	ORGANIC MATTER % ORGANIC CARBON 6A1a	ORGANIC MATTER % NITROGEN	ORGANIC MATTER C/N	8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS (per cent) 1/10 ATMOS.	MOISTURE TENSIONS (per cent) 1/3 ATMOS.	15 ATMOS. 4B2
	6.9	7.3	7.4	2.38			-	1.8	-	-			8.9
	8.5	9.3	9.6	1.13			-	1.4	2	-			9.8
	8.7	9.5	9.5	0.80			-	1.6	2	-			23.8
	8.9	9.3	9.5	0.62			-	2.1	8	-			25.3
	8.5	9.2	9.6	0.32			-	3.5	18	-			17.5
	8.1	9.0	9.2	0.19			-	3.2	18	-			14.2
	7.9	8.7	9.0	0.09			-	2.8	13	-			12.3
	7.8	8.6	9.0	0.07			-	1.2	8	-			11.2

LABORATORY NUMBER	5A1a CATION EXCHANGE CAPACITY NH_4OAc	5B1a CATIONS EXTRACTABLE Ca 6N2b	5B1a CATIONS EXTRACTABLE Mg 6O2b	5B1b EXCHANGEABLE Na 6P2a	5B1b EXCHANGEABLE K 6Q2a	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1 6P1a Na	6Q1a K	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
	milliequivalents per 100g soil						milliequivalents per liter						
	21.3	10.8	8.4	0.3	3.3	1	0.9	4.7					58.4
	17.0			1.1	5.7	6	6.7	4.7					50.4
	30.8			5.4	12.3	18	13.7	2.9					84.9
	29.2			7.3	9.8	25	24.6	2.7					116.5
	22.7			4.2	5.0	18	33.0	2.9					88.7
	20.1			2.5	3.0	12	23.7	2.4					63.0
	20.8			1.5	2.3	7	1.3	1.8					52.3
	21.3			0.7	2.0	3	4.8	0.9					48.5

a. Largely calcareous concretions.

AGR-SCS-BELTSVILLE, MD 2002 JUNE 1953

Soil type: Silver Creek silt loam
Soil No.: S51Nebr-40-9-(1-8)
Location: About 850 feet west of S1/4 corner, (SE1/4 SW1/4), Sec. 34, T12N, R11W, Hall County, Nebraska.
Vegetation: Nonirrigated corn; will probably yield 25-35 bushels per acre.
Parent material: Loess.
Physiographic position: This soil occupies a slightly higher terrace position than the Exline silt loam with which it is associated. According to local information the sand and gravel is not encountered until around 15-18 feet. The area however, is one in which the ground water is encountered at 4½ to 6 or 7 feet.
Topography: Level plain.
Slope: Less than 1 percent.
Drainage: Medium slow.
Erosion: None or slight.
Moisture: Moist.
Stoniness: None.
Described by: B. H. Williams.
Date: October 9, 1951.
Mandan

Lab.No.	Horizon	
933	A1p	0-7 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam (but with considerable very fine sand present) granular, friable; noncalcareous although in numerous places checked in field, the surface soil was calcareous.
934	A12	7-12 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam soft granular, friable; moderately calcareous.
935	B21	12-17 inches. Dark gray (10YR 4/1 dry) to weak dark gray (10YR 3/1 moist) silty clay; angular blocky, sticky when moist and hard when dry; matrix is noncalcareous for the most part, but free lime segregations are common.
936	B22	17-22 inches. Grayish brown (2.5Y 5/2 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay; angular blocky; very sticky and plastic when wet; hard when dry; calcareous, lime concretions larger and more numerous than in horizon above.

SCS-421
10-64

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Thurman sandy loam SOIL Nos. S60Nebr-2-1 LOCATION Antelope County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 13472-13477 December 1964

Depth (In.)	Horizon	1Ala Size class and particle diameter (mm) 3A1													Coarse fragments		
		Total			Sand					Silt					2A2 ≥ 2	2A2 2 - 19	19 - 76
		Sand (2–0 05)	Silt (0.05–0 002)	Clay (< 0 002)	Very coarse (2–1)	Coarse (1–0 5)	Medium (0 5–0 25)	Fine (0 25–0 1)	Very fine (0 1–0 05)	0 05–0 02	Int. III (0 02–0 002)	Int. II (0 2–0.02)	(2–0 1)				
		Pct. of < 2 mm													Pct	Pct. of < 76mm	
0-7	A1p	88.0	7.1	4.9	2.0	10.8	21.8	45.3	8.1	4.2	2.9	30.5	79.9		-	-	
7-12	A12	81.4	10.0	8.6	1.1	7.0	16.7	43.0	13.6	6.6	3.4	39.8	67.8		-	-	
12-16	AC	82.5	8.6	8.9	0.6	6.8	16.2	44.5	14.4	6.3	2.3	41.9	68.1		-	-	
16-23	C1	86.1	6.1	7.8	0.6	7.4	21.0	46.7	10.4	3.9	2.2	34.3	75.7		-	-	
23-44	C2	90.2	4.8	5.0	0.8	8.3	24.0	49.1	8.0	2.9	1.9	30.2	82.2		tr.	tr.	
44-60	C3	89.8	4.8	5.4	1.0	11.0	26.1	42.9	8.8	3.0	1.8	28.9	81.0		tr.	tr.	

Depth (In.)	6Ala Organic carbon	6B1a Nitrogen	C/N		6E1c Carbonate as $CaCO_3$	6C1a Ext. Iron as Fe_2O_3	Bulk density 4Ala Field-State			Water content 4B4 Field-State	4B1a 1/10-Bar Pieces	4B2 15-Bar		pH		8C1a (1.1) H_2O
	Pct	Pct.			Pct	Pct.	g/cc	g/cc	g/cc	Pct.	Pct	Pct.				
0-7	0.47	0.051	9			0.2						2.4				6.2
7-12	0.52	0.054	10			0.3	1.72			11.0	11.6	3.8				5.8
12-16	0.41	0.046	9			0.3						3.6				6.0
16-23	0.29	0.032	9			0.3						3.6				6.1
23-44	0.13	0.017				0.2					6.8	2.3				6.5
44-60	0.06					0.2						2.2				6.6

Depth (In.)	Extractable bases 5B1a 6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	Ext. Acidity	Cat. Exch. Cap. 5A3a Sum Cations	5A1a NH_4OAc						Base saturation 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g														
0-7	2.7	0.5	tr.	0.7	3.9	2.0	5.9	4.6						66	85
7-12	4.1	0.7	tr.	0.8	5.6	3.2	8.8	6.7						64	84
12-16	4.9	0.7	tr.	0.2	5.8	2.2	8.0	6.7						72	86
16-23	4.4	0.8	tr.	0.2	5.4	1.8	7.2	5.9						75	92
23-44	2.5	0.9	tr.	0.1	3.5	1.5	5.0	3.8						70	92
44-60	2.7	0.9	tr.	0.1	3.7	2.5	6.2	3.9						60	95

Soil type: Thurman sandy loam
Soil No.: S60Nebr-2-1
Location: 375 feet west and 250 feet south of northeast corner, Sec. 34, T28N, R6W, Antelope County, Nebraska.
Physiography: Undulating to low hummocky sandy area.
Slope: 3 percent; east to southeast slope sampled.
Parent material: Eolian sand.
Drainage: Good.
Permeability: Moderately rapid.
Land use: Corn, in 1960.
Described by: Herbert L. Kollmorgen and John Elder, June 1960.

Horizon and Lincoln Lab. Number	
Alp 13472	0 to 7 inches. Very dark grayish brown (10YR 3/2 moist) sandy loam; single grained; loose moist; abrupt smooth boundary.
A12 13473	7 to 12 inches. Very dark grayish brown (10YR 3/2 moist) fine sandy loam; weak coarse subangular blocky breaking to massive structure; very friable moist; clear smooth boundary.
AC 13474	12 to 16 inches. Dark grayish brown to very dark grayish brown (10YR 3.5/2 moist) fine sandy loam; weak coarse subangular blocky breaking to massive structure; very friable moist; gradual wavy boundary.
C1 13475	16 to 23 inches. Dark grayish brown (10YR 4/2 moist) loamy sand; single grain; loose moist; gradual wavy boundary.
C2 13476	23 to 44 inches. Dark grayish brown to brown (10YR 4/2.5 moist) loamy sand; single grain structure; loose moist; gradual wavy boundary.
C3 13477	44 to 60 inches. Brown (10YR 5/3 moist) fine sand; single grain structure; loose moist.

SCS-421
10-64

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Thurman sandy loam SOIL Nos. 859Nebr-26-4 LOCATION Dixon County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 12397-12404 December 1964

Depth (In.)	Horizon	1B1a Total: Sand (2–0.05)	Silt (0.05–0.002)	Clay (< 0.002)	Size class and particle diameter (mm) 3A1 Sand: Very coarse (2–1)	Coarse (1–0.5)	Medium (0.5–0.25)	Fine (0.25–0.1)	Very fine (0.1–0.05)	Silt: 0.05–0.02	Int. III (0.02–0.002)	Int. II (0.2–0.02)	(2–0.1)			Coarse fragments: 2A2 ≥ 2 Pct.	2A2 2–19 Pct of < 76mm	19–76 Pct of < 76mm
		Pct of < 2 mm																
0-5	A1p	78.9	15.2	5.9	1.5	18.0	26.5	28.5	4.4	9.8	5.4	21.6	74.5			-	-	
5-14	A12	78.8	13.0	8.2	1.2	17.7	27.4	29.7	2.8	8.7	4.3	20.2	76.0			-	-	
14-21	A3	83.4	10.3	6.3	1.0	17.1	27.0	34.8	3.5	6.1	4.2	20.8	79.9			-	-	
21-30	AC	88.5	6.1	5.4	1.0	16.7	29.4	38.1	3.3	4.3	1.8	19.6	85.2			-	-	
30-36	C1	84.9	9.5	5.6	1.1	12.2	25.0	41.1	5.5	6.0	3.5	26.5	79.4			tr.	tr.	
36-41	C2	81.2	11.9	6.9	7.2	14.3	19.3	34.7	5.7	8.5	3.4	27.0	75.5			tr.	tr.	
41-52	C3	92.6	3.1	4.3	10.6	22.3	21.1	32.7	5.9	2.2	0.9	21.3	86.7			tr.	tr.	
52-66	C4	95.6	1.8	2.6	1.5	21.9	30.1	38.1	4.0	1.3	0.5	17.9	91.6			-	-	

Depth (In.)	6A1a Organic carbon	6B1a Nitrogen	C/N		6E1d Carbonate as $CaCO_3$	6C1a Ext. Iron as Fe_2O_3	Bulk density: 4A1a Field-State			Water content: 4B4 Field-State	4B1a 1/10-Bar	4B1a 1/3-Bar	4B2 15-Bar			pH: 8C1a (1:1) H_2O		
	Pct	Pct.			Pct.	Pct.	g/cc	g/cc	g/cc	Pct.	Pct	Pct	Pct					
0-5	0.73	0.075	10		tr.	0.4					10.8	6.9	2.6					7.0
5-14	0.74	0.061	12			0.4	1.61			10.2	14.9	7.7	3.8					6.2
14-21	0.32	0.038	8			0.4					9.4	5.4	2.3					6.4
21-30	0.23	0.023				0.3	1.66			12.5	7.8	4.0	2.2					6.4
30-36	0.16				-	0.3					7.2	3.9	1.7					6.5
36-41	0.16				-	0.4					10.6	5.7	3.0					6.5
41-52	0.06				-	0.3					3.4	2.0	1.4					6.6
52-66	0.02				-	0.2					2.7	1.7	0.8					6.7

Depth (In.)	Extractable bases 5B1a: 6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap.: 5A3a Sum Cations	5A1a NH_4OAc	8D3 Ca/Mg	Base saturation: 5C3 Sum Cations[a]	5C1 NH_4OAc CEC[a]
	meq/100 g									Pct	Pct.
0-5	6.4	1.0	tr.	0.4	7.8	1.4	9.2	6.9	6.4	85	113
5-14	5.7	1.2	tr.	0.2	7.1	2.8	9.9	7.8	4.8	72	91
14-21	3.9	1.0	tr.	0.1	5.0	1.6	6.6	5.2	3.9	76	96
21-30	2.7	0.8	tr.	0.1	3.6	1.6	5.2	3.9		69	92
30-36	3.0	1.0	tr.	0.1	4.1	1.4	5.5	4.4	3.0	74	93
36-41	3.7	1.1	tr.	0.2	5.0	1.4	6.4	5.4	3.4	78	92
41-52	2.0	0.9	tr.	0.1	3.0	0.9	3.9	2.8		77	107
52-66	1.4	0.5	tr.	0.1	2.0	0.9	2.9	2.2		69	91

Depth (In.)	Ratios to Clay 8D1: NH_4OAc CEC	15-Bar Water
0-5	1.17	0.4
5-14	0.95	0.5
14-21	0.82	0.4
21-30	0.72	0.4
30-36	0.78	0.3
36-41	0.78	0.4
41-52	0.65	0.3
52-66	0.85	0.3

a. One or more horizons has relatively low cation exchange capacity. As cation exchange capacity decreases, the relative error of base saturation increases. Trace quantities are omitted from the sum of bases. For very low CEC values, this omission contributes significantly to the relative error of base saturation.

Soil type: Thurman sandy loam
Soil No.: S59Nebr-26-4
Location: 850 feet north and 200 feet east of west 1/4 corner, Sec. 27, T27N, R5E, Dixon County, Nebraska; one

Physiography: Gently rolling transition sand-loess hills area. (Usually deep sand over Peorian loess.)
Relief: B slopes; single convex slopes.
Slope: 3 to 4 percent southwest.
Parent material: Eolian sand.
Drainage: Well drained.
Permeability: Moderately rapid.
Land use: Cultivated; in corn.
Described by: Herbert L. Kollmorgen and John Elder, November 3, 1959.

Horizon and Lincoln Lab. Number	
A1p 12397	0 to 5 inches. Very dark brown (10YR 2/2 moist) sandy loam; weak medium and fine crumb breaking to single grained; very friable moist; no effervescence; abrupt smooth boundary.
A12 12398	5 to 14 inches. Very dark brown (10YR 2/2 moist) sandy loam; weak coarse and medium subangular blocky to weak fine and very fine crumb; very friable moist; no effervescence; clear smooth boundary.
A3 12399	14 to 21 inches. Very dark grayish-brown (10YR 3/2 moist) sandy loam; weak medium and fine subangular blocky breaking to single grained; very friable moist; no effervescence; gradual smooth lower boundary.
AC 12400	21 to 30 inches. Very dark grayish-brown to dark brown (10YR 3.5/3 moist) sandy loam; weak medium and fine subangular blocky to single grained; loose moist; no effervescence; gradual smooth lower boundary.
C1 12401	30 to 36 inches. Dark brown (10YR 4/3 moist) sandy loam; weak medium and fine subangular blocky to single grained; very friable moist; no effervescence; gradual smooth lower boundary.
C2 12402	36 to 41 inches. Dark yellowish-brown (10YR 4/4 moist) sandy loam; weak medium and fine subangular blocky to single grained; very friable moist; no effervescence; clear smooth lower boundary.
C3 12403	41 to 52 inches. Yellowish-brown (10YR 5/4 moist) coarse sand; contains a small amount of very fine gravel; single grained; loose moist; no effervescence; gradual smooth lower boundary.
C4 12404	52 to 66 inches. Brown (10YR 5/3 moist) sand; single grained; loose.

Deeper borings below the pit sampled showed the following:

66 to 92 inches. Brown to pale brown (10YR 5.5/3 moist) sand; loose.

92 to 96 inches. Brown (10YR 5/3 moist) sand; common fine distinct yellowish-brown iron stains; loose.

96 to 101 inches. Yellowish-brown (10YR 5/4 moist) sand; numerous medium and fine common distinct iron stains; loose.

101 to 120 inches. Brown (10YR 5/3 moist) sand; loose; noncalcareous to 120 inches.

Note: The above profile had a slightly heavier layer from 30 to 36 inches which could possibly be a loam but it was still believed to be a sandy loam. Such somewhat heavier layers are typical in the moderately sandy soils in this area. The upper 3 feet contained some evidence of old decayed roots which are believed to have been shrub or tree roots.

SCS-421
10-64

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Thurman sandy loam SOIL Nos. S59Nebr-26-5 LOCATION Dixon County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 12405-12413 December 1964

Depth (In.)	Horizon	1Bla Total Sand (2–0.05)	Total Silt (0.05–0.002)	Total Clay (< 0.002)	Size class and particle diameter (mm) 3A1 Sand: Very coarse (2–1)	Sand: Coarse (1–0.5)	Sand: Medium (0.5–0.25)	Sand: Fine (0.25–0.1)	Sand: Very fine (0.1–0.05)	Silt: 0.05–0.02	Silt: Int III (0.02–0.002)	Int. II (0.2–0.02)	(2–0.1)			Coarse fragments 2A2 ≥ 2 Pct	Coarse fragments 2A2 2–19 Pct. of < 76mm	Coarse fragments 19–76 Pct. of < 76mm
		Pct. of < 2 mm																
0-6	Alp	72.8	18.7	8.5	0.5	11.7	18.9	36.7	5.0	12.3	6.4	30.8	67.8			-	-	
6-11	A12	74.0	16.9	9.1	0.4	9.3	18.1	39.2	7.0	11.1	5.8	31.1	67.0			-	-	
11-14	A3	78.9	13.5	7.6	0.9	11.6	20.4	40.0	6.0	7.8	5.7	27.0	72.9			-	-	
14-18	AC	82.7	10.9	6.4	1.6	12.5	20.3	42.3	6.0	6.6	4.3	27.9	76.7			-	-	
18-28	C1	84.8	8.1	7.1	0.5	11.3	21.8	44.2	7.0	5.3	2.8	27.8	77.8			-	-	
28-34	C2	81.3	11.0	7.7	0.7	9.9	18.4	44.6	7.7	6.1	4.9	30.4	73.6			-	-	
34-45	C3	82.7	10.4	6.9	0.4	9.6	20.6	44.7	7.4	6.4	4.0	31.5	75.3			-	-	
45-53	C4	82.7	10.4	6.9	0.5	7.5	17.1	48.2	9.4	6.2	4.2	33.1	73.3			-	-	
53-60	C5	87.6	7.1	5.3	0.3	5.1	20.7	53.9	7.6	4.4	2.7	28.1	80.0			-	-	

Depth (In.)	6Ala Organic carbon Pct	6Bla Nitrogen Pct	C/N		6Elc Carbonate as $CaCO_3$ Pct.	6Cla Ext. Iron as Fe_2O_3 Pct.	Bulk density 4Ala Field-State g/cc	Bulk density g/cc	Bulk density g/cc	Water content 4B4 Field-State	Water content 4Bla 1/10-Bar Pct	Water content 4Bla 1/3-Bar Pct.	Water content 4B2 15-Bar Pct.			pH 8Cla (1:1) H_2O		
0-6	0.77	0.066	12			0.5					15.1	8.3	3.9			5.8		
6-11	0.54	0.058	9			0.5	1.69			7.9	16.9	9.5	4.4			6.4		
11-14	0.44	0.046	10		-	0.5					11.4	7.8	3.0			6.5		
14-18	0.28	0.030	9		-	0.4					8.3	6.1	2.7			6.6		
18-28	0.20	0.025			-	0.4	1.69			9.7	9.0	5.4	3.2			6.7		
28-34	0.17				-	0.4					10.6	6.7	3.4			6.8		
34-45	0.09				-	0.4	1.77			6.3	7.4	4.6	2.8			6.9		
45-53	0.10				-	0.4					8.4	5.8	2.7			6.9		
53-60	0.06				-	0.3					6.4	3.9	2.0			7.0		

Depth (In.)	Extractable bases 6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	6Hla Ext. Acidity	Cat. Exch. Cap. 5A3a Sum Cations	5Ala NH_4OAc						8D3 Ca/Mg		Base saturation 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct
	meq/100 g																
0-6	4.9	1.4	tr.	0.2	6.5	3.3	9.8	7.6						3.5		66	86
6-11	6.1	1.5	tr.	0.2	7.8	2.4	10.2	8.2						4.1		76	95
11-14	5.5	1.6	tr.	0.2	7.3	2.4	9.7	7.3						3.4		75	100
14-18	4.4	1.3	tr.	0.2	5.9	1.6	7.5	6.0						3.4		79	98
18-28	4.2	1.6	tr.	0.2	6.0	1.4	7.4	6.0						2.6		81	100
28-34	4.7	1.8	tr.	0.2	6.7	1.6	8.3	6.6						2.6		81	102
34-45	3.6	1.6	tr.	0.2	5.4	1.4	6.8	5.0						2.2		79	108
45-53	3.9	1.6	tr.	0.2	5.7	1.2	6.9	5.7						2.4		83	100
53-60	2.9	1.3	tr.	0.1	4.3	1.2	5.5	4.1						2.2		78	105

Depth (In.)	Ratios to Clay 8B1 NH_4OAc CEC		15-Bar Water		
0-6	0.89		0.4		
6-11	0.90		0.5		
11-14	0.96		0.4		
14-18	0.94		0.4		
18-28	0.84		0.4		
28-34	0.86		0.4		
34-45	0.72		0.4		
45-53	0.83		0.4		
53-60	0.77		0.4		

Soil type: Thurman sandy loam
Soil No.: S59Nebr-26-5
Location: 1000 feet south and 80 feet west of north 1/4 corner, Sec. 22, T28N, R4E, Dixon County, Nebraska; Northeast Nebraska Experimental Farm, 2 miles east of Concord, Nebraska.
Physiography: Gently rolling sand-loess hills area. Deep sand over Peorian loess.
Relief: B slope; single convex slope.
Slope: 3 to 4 percent northwest to west slope.
Parent material: Eolian sand.
Drainage: Well drained.
Permeability: Moderately rapid.
Land use: Cultivated; in sorghum.
Described by: Herbert L. Kollmorgen and John Elder, November 3, 1959.

Horizon and Lincoln Lab. Number

Alp 12405 — 0 to 6 inches. Very dark brown (10YR 2/2 moist) sandy loam; weak medium and fine subangular blocky breaking to fine and very fine crumb; very friable moist; no effervescence; abrupt smooth lower boundary.

A12 12406 — 6 to 11 inches. Very dark brown (10YR 2/2 moist) fine sandy loam or loam; weak coarse subangular blocky breaking to fine and very fine crumb; very friable moist; no effervescence; clear smooth lower boundary.

A3 12407 — 11 to 14 inches. Very dark grayish brown to dark brown (10YR 3/2.5 moist) sandy loam; weak fine and medium subangular blocky to single grained; very friable moist; no effervescence; clear smooth lower boundary.

AC 12408 — 14 to 18 inches. Dark brown (10YR 3/3 moist) sandy loam; weak coarse and medium subangular blocky to single grained; very friable moist; no effervescence; clear smooth lower boundary.

C1 — 18 to 28 inches. Dark brown (10YR 4/3 moist) sandy loam; weak very coarse subangular blocky to single

C2 12410 — 28 to 34 inches. Dark brown (10YR 4/3 moist) sandy loam; weak coarse subangular blocky to single grained; very friable moist; no effervescence; diffuse lower boundary.

C3 12411 — 34 to 45 inches. Dark brown (10YR 4/3 moist) sandy loam; single grained; very friable moist; no effervescence; diffuse smooth lower boundary.

C4 12412 — 45 to 53 inches. Dark brown (10YR 4/3 moist) sandy loam; weak coarse and medium subangular blocky to weak fine and fine subangular blocky; very friable or loose moist; no effervescence; gradual smooth lower boundary.

C5 12413 — 53 to 60 inches. Yellowish brown (10YR 5/4 moist) loamy sand; single grained and loose; no effervescence.

Borings were made below the pit to 120 inches. Colors were not checked in detail but varied from light brownish gray to pale brown and light yellowish brown. Textures were recorded as follows:

60 to 81 inches. Light fine sandy loam or loamy fine sand.

81 to 92 inches. Fine sandy loams.

92 to 120 inches. Loamy sands or sands.

SCS-421
10-64

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Thurman loamy fine sand SOIL Nos. S60Nebr-70-1 LOCATION Pierce County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 13478-13483 December 1964

Depth (In.)	Horizon	1B1a Total: Sand (2–0.05)	Silt (0.05–0.002)	Clay (< 0.002)	Size class and particle diameter (mm) 3A1 Sand: Very coarse (2–1)	Coarse (1–0.5)	Medium (0.5–0.25)	Fine (0.25–0.1)	Very fine (0.1–0.05)	Silt: 0.05–0.02	Int. III (0.02–0.002)	Int. II (0.2–0.02)	(2–0.1)			Coarse fragments 2A2 > 2 Pct.	2A2 2–19 Pct. of < 76mm	19–76
0-8	A1p	88.8	5.8	5.4	1.0	8.3	19.2	51.6	8.7	4.3	1.5	36.4	80.1			-	-	
8-15	A12	78.1	13.1	8.8	0.3	5.5	17.4	46.7	8.2	7.8	5.3	36.2	69.9			-	-	
15-20	AC	81.6	10.2	8.2	0.2	5.2	20.2	48.8	7.2	6.6	3.6	33.6	74.4			-	-	
20-29	C1	89.0	4.2	6.8	0.4	7.0	26.5	50.5	4.6	2.2	2.0	24.5	84.4			-	-	
29-40	C2	88.4	4.7	6.9	0.8	6.4	20.2	53.5	7.5	2.1	2.6	32.2	80.9			-	-	
40-60	C3	93.0	2.6	4.4	0.2	4.4	17.8	62.8	7.8	1.8	0.8	37.9	85.2			-	-	

Pct. of < 2 mm

Depth (In.)	6A1a Organic carbon Pct	6B1a Nitrogen Pct.	C/N		6E1c Carbonate as $CaCO_3$ Pct.	6C1a Ext. Iron as Fe_2O_3 Pct.	Bulk density 4A1a Field-State g/cc	g/cc	g/cc		Water content 4B4 Field-State Pct	4B1a 1/10-Bar Pieces Pct.	4B2 15-Bar Pct.					pH 8C1a (1:1) H_2O
0-8	0.36	0.043	8			0.2							2.2					6.1
8-15	0.60	0.063	10			0.3	1.58				10.0	12.6	4.2					6.1
15-20	0.37	0.044	8			0.3							3.6					6.3
20-29	0.18	0.024				0.3							2.8					6.5
29-40	0.14					0.2	1.66				7.0	8.1	3.1					6.5
40-60	0.05					0.1							2.0					6.6

Depth (In.)	Extractable bases 5B1a 6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap. 5A3a Sum Cations	5A1a NH_4OAc							8D3 Ca/Mg		Base saturation 5C3 Sum Cations Pct[a]	5C1 NH_4OAc CEC Pct[a]
	meq/100 g																	
0-8	2.9	0.4	tr.	0.3	3.6	2.5	6.1	4.1									59	88
8-15	5.3	1.2	tr.	0.2	6.7	3.2	9.9	7.7							4.4		68	87
15-20	4.8	1.3	tr.	0.2	6.3	2.5	8.8	6.8							3.7		72	93
20-29	4.0	1.1	tr.	0.1	5.2	1.7	6.9	5.4							3.6		75	96
29-40	3.5	1.3	tr.	0.1	4.9	1.7	6.6	5.1							2.7		74	96
40-60	1.8	0.7	tr.	0.1	2.6	1.0	3.6	3.0									72	87

Depth (In.)	Ratios to Clay 8D1 NH_4OAc CEC		15-Bar Water		
0-8	0.76		0.4		
8-15	0.88		0.5		
15-20	0.83		0.4		
20-29	0.79		0.4		
29-40	0.74		0.4		
40-60			0.4		

a. One or more horizons has relatively low cation exchange capacity. As cation exchange capacity decreases, the relative error of base saturation increases. Trace quantities are omitted from the sum of bases. For very low CEC values, this omission contributes significantly to the relative error of base saturation.

USDA-SCS HYATTSVILLE MD 1964

Soil type: Thurman loamy fine sand
Soil No.: S60Nebr-70-1
Location: 1700 feet north and 210 feet west of southeast corner, Sec. 22, T27N, R3W, Pierce County, Nebraska.
Relief: Gentle slope.
Physiography: Undulating sandy upland.
Slope: 2 to 3 percent; south slope.
Parent material: Eolian sand.
Drainage: Well drained.
Permeability: Moderately rapid.
Land use: Cropland; in corn, 1960.
Described by: Herbert L. Kollmorgen and John Elder, June 1960.

Horizon and Lincoln Lab. Number	
Alp 13478	0 to 8 inches. Dark gray to dark grayish brown (10YR 4/1.5 moist) loamy fine sand; single grained structure; loose moist; abrupt smooth boundary.
A12 13479	8 to 15 inches. Very dark gray (10YR 3/1 moist) fine sandy loam; weak very fine crumb breaking to single grained structure; very friable moist; clear wavy boundary.
AC 13480	15 to 20 inches. Very dark grayish brown to dark grayish brown (10YR 3.5/2 moist) fine sandy loam; weak very fine crumb breaking to single grained structure; very friable moist; clear wavy boundary.
C1 13481	20 to 29 inches. Dark grayish brown (10YR 4/2 moist) light fine sandy loam; single grained structure; loose moist; gradual wavy boundary.
C2 13482	29 to 40 inches. Dark grayish brown to brown (10YR 4/2.5 moist) loamy fine sand; single grain structure; loose moist; gradual wavy boundary.
C3 13483	40 to 72 inches. Sampled 40 to 60 inches. Brown (10YR 5/3 moist) fine sand; single grain structure; loose moist.

OIL SURVEY LABORATORY Lincoln, Nebr. April 1963

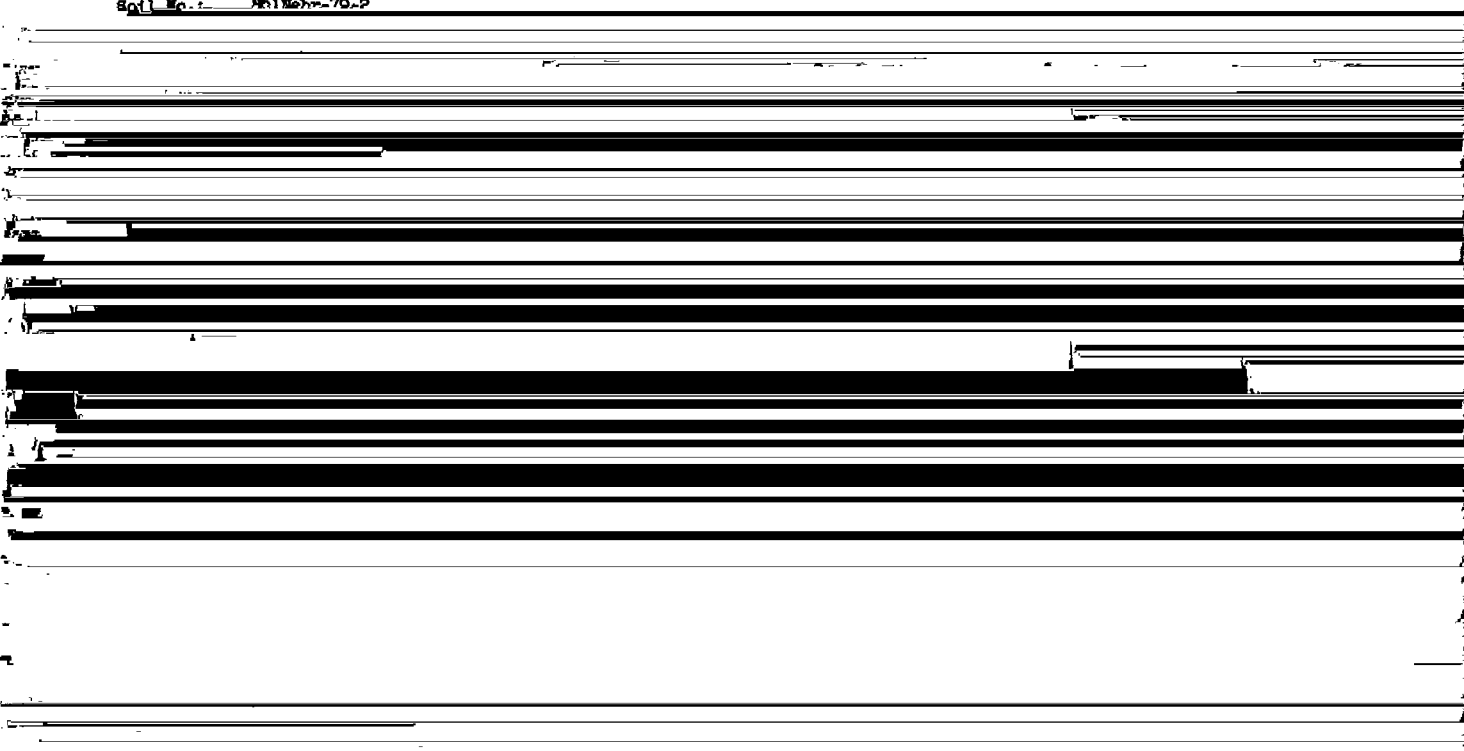
SOIL TYPE Tripp fine sandy loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. 861Nebr-79-2 **LAB. NOS.** 15683-15690

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-9	Ap	0.6	3.0	4.9	21.0	35.8	23.2	11.5	65.6	6.6	1	vfsl
9-14	A11	0.4	3.0	4.9	19.3	37.0	24.1	11.3	66.1	7.4	Tr.	vfsl
14-24	A12	0.2	3.9	5.7	20.4	36.0	23.0	10.8	65.3	6.6	1	vfsl
24-35	C11ca	0.4	3.7a	5.8a	19.8a	36.1a	25.1	9.1	66.8	7.0	Tr.	vfsl
35-46	C12ca	0.2	3.2a	5.0a	17.7a	35.9a	28.4	9.6	66.7	8.8	Tr.	vfsl
46-54	C21ca	0.1	0.6a	1.2a	5.5a	31.0a	51.1	10.5	68.5	17.4	Tr.	sil
54-66	C22ca	Tr.	0.6a	1.0a	7.1a	40.0a	44.1	7.2	77.8	11.6	Tr.	l/vfsl
66-74	C3	0.2	2.9a	4.9a	19.1a	40.4a	25.6	6.9	70.9	6.7	1	vfsl

8C1a pH 1:1	Extractable Iron as Fe %	Organic Matter 6A1a O.C. %	6B1a N %	C/N	Bulk Density Field Moist 4B4 % M.	4A1a g/cc	30 Cm. 4B3 % M.	4A1c g/cc	A.D. 4A1b g/cc	Moisture Retention 4B1b 1/10-Atm. Pieces %	4B2 15-Atm. Sieved %
7.7		0.54	0.058	9						20.1	6.2
7.5		0.38	0.047	8						22.0	6.6

Soil type: Tripp fine sandy loam, loamy substratum
Soil No.: [illegible]



Parent material: Alluvium.
Physiography: North Platte Valley high terrace.
Relief: 0 to 2 feet.
Drainage: Somewhat excessive.
Elevation: 4,100 feet.
Ground water: Deep.
Slope: Less than 1 percent.
Moisture: Moist.
Root distribution: Numerous to 9 inches, plentiful to 46 inches, none below.
Erosion: Slight.
Permeability: Moderately rapid.
Land use: Irrigated corn.
Date: August 28, 1961. Described by: Donald A. Yost.

Horizon and Lincoln Lab. Number	
Ap 15683	0 to 9 inches. Light brownish gray (10YR 6/2 dry) fine sandy loam, dark grayish brown (10YR 4/2) when moist; weak fine and medium granular structure; soft when dry, very friable when moist; noncalcareous; pH (paste) 7.8; pH (2:1) 7.8; nonsaline; abrupt smooth boundary.
A11 15684	9 to 14 inches. Color, texture and consistence as in above horizon. Weak coarse blocky structure; noncalcareous; pH (paste) 7.6; pH (2:1) 7.8; nonsaline; clear smooth boundary.
A12 15685	14 to 24 inches. Color, texture and consistence as in above horizon; massive (structureless); noncalcareous; pH (paste) 7.6; pH (2:1) 8.1; nonsaline; abrupt wavy boundary.
C11ca 15686	24 to 35 inches. Light gray (10YR 7/2 dry) fine sandy loam, grayish brown (10YR 5/2) when moist; weak medium blocky structure; soft when dry, very friable when moist; very strongly calcareous; pH (paste) 7.8; pH (2:1) 8.1; nonsaline; clear wavy boundary.
C12ca 15687	35 to 46 inches. Soil characteristics are as given in above horizon. This is an arbitrary separation made because of the thickness of the material between 24 and 46 inches; pH (paste) 7.9; pH (2:1) 8.0; nonsaline; abrupt wavy boundary.
C21ca 15688	46 to 54 inches. White (10YR 8/1 dry) silt loam, light gray (10YR 7/2) when moist; moderate medium subangular blocky structure; hard when dry, friable when moist; very strongly calcareous; pH (paste) 7.8; pH (2:1) 7.8; nonsaline; clear wavy boundary.
C22ca 15689	54 to 66 inches. White (10YR 8/2 dry) very fine sandy loam, light brownish gray (10YR 6/2) when moist; weak medium subangular blocky structure; soft when dry, very friable when moist; very strongly calcareous; pH (paste) 7.8; pH (2:1) 7.6; nonsaline; clear wavy boundary.
C3 15690	66 to 74+ inches. Very pale brown (10YR 8/3 dry) fine sandy loam, brown (10YR 5/3) when moist; weak medium subangular blocky structure; soft when dry, very friable when moist; strongly calcareous; pH (paste) 7.8; pH (2:1) 7.9; nonsaline.

Note: The profile herein described is modal for this particular phase and for the soils as they occur in Scotts Bluff County. The lower boundary of the C12ca horizon is tongued through the horizon below. It was observed that roots did not penetrate the C21ca horizon. A 3-inch Krotovina was noted in the lowest horizon sampled. Horizons Ap, C11ca, and C21ca were sampled for the Bureau of Public Roads. The very fine sands include approximately 30 percent quartz, 20 percent identified feldspar, 30 percent highly altered grains, and 15 percent glass shards. The pattern of feldspar alteration changes little with depth. Some grains are thought to be altered glass. The index of refraction of these grains is less than that of clove oil. A minor portion of the glass appears to be obsedian.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1963

SOIL TYPE Tripp fine sandy loam **LOCATION** Scotts Bluff County, Nebraska

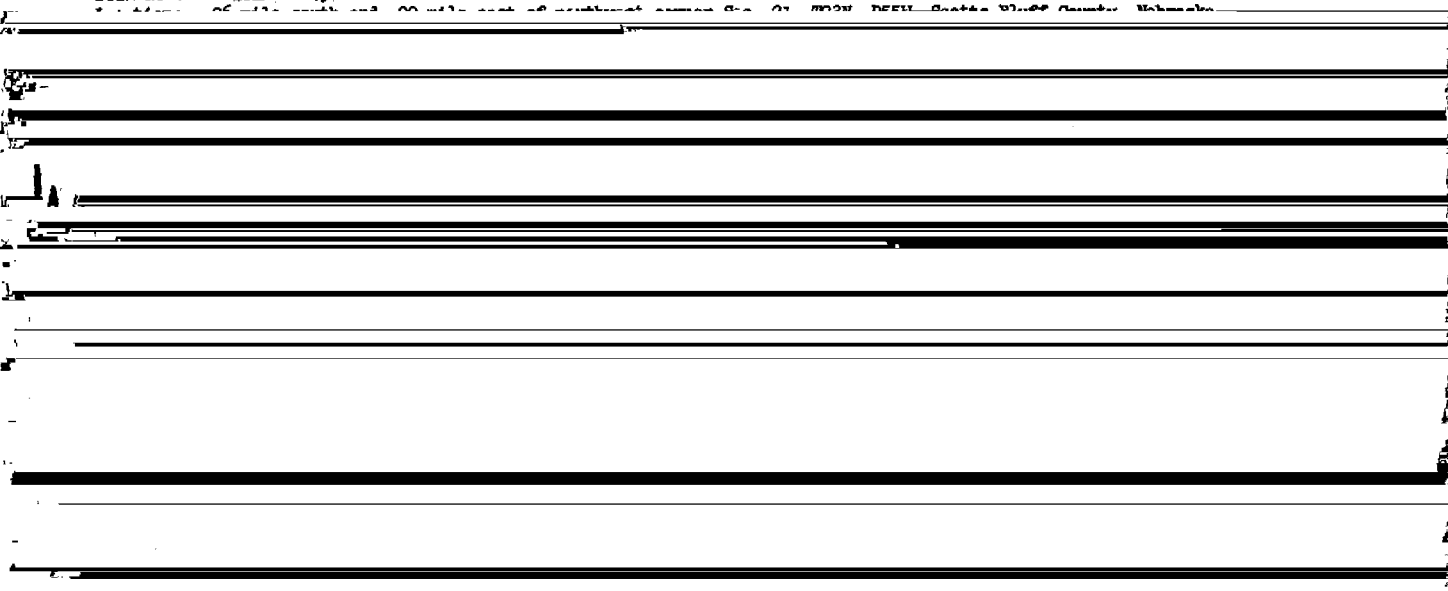
SOIL NOS. S61Nebr-79-1 **LAB. NOS.** 15675-15682

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	3A1 0.02-0.002	2A2 > 2 (<19mm)	TEXTURAL CLASS
0-9	A1p	0.7	2.1	5.4	23.9	39.9	18.8	9.2	69.0	4.8	Tr.	vfsl
9-17	A1	0.6	2.2	6.4	24.9	36.0	20.9	9.0	65.2	6.5	Tr.	vfsl
17-26	AC	0.7	1.9	5.6	26.2	36.9	18.6	10.1	66.6	5.2	1	vfsl
26-37	C1ca	0.3	2.2	5.5	25.6	37.5	20.3	8.6	67.7	6.3	1	vfsl
37-41	C21ca	0.3	1.3a	3.6a	17.0a	38.9a	30.2	8.7	70.0	10.2	1	vfsl
41-53	C22ca	0.1	1.6a	3.4a	15.1a	39.8a	31.4	8.6	70.1	10.9	1	vfsl
53-63	C31	0.5	1.7a	3.3a	13.4a	37.3a	35.9	7.9	70.6	11.3	2	vfsl
63-73+	C32	0.9a	1.6a	3.4a	16.0a	38.3a	33.0	6.8	72.0	9.4	1	vfsl

8C1a pH 1:1	6C1a Ext. Iron as Fe %	Organic Matter 6A1a O.C.[b] %	6B1a N %	C/N	Bulk Density Field Moist 4B4 % M.	4A1a g/cc	30 Cm. 4B3 % M.	4A1c g/cc	A.D. 4A1b g/cc	Moisture Retention 4B1b 1/10-Atm Pieces %	4B2 15-Atm. Sieved %
7.3	0.4	0.57	0.063	9	6.8	1.68	18.1	1.61	1.68	19.1	5.4
7.2	0.4	0.35	0.045	8	10.9	1.59	19.8	1.56	1.61	18.4	5.6
7.4	0.4	0.29	0.041	7	9.7	1.46	16.7	1.42	1.46	18.4	5.8
7.8	0.4	0.25									5.9
7.8	0.4	0.18									7.8
7.8	0.3	0.17			17.7	1.32	32.0	1.30	1.34	30.3	8.4
7.8	0.3	0.12									7.4
7.9	0.4	0.10									6.8

5A1a CATION EXCHANGE CAPACITY	EXTRACTABLE CATIONS 5B1a 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	Base Sat. on NH_4OAc	on Sum Bases	Ratios to Clay 15-	Cat.	8D1	Carbonate as $CaCO_3$ Whole	Clay-

Soil type: Tripp fine sandy loam, loamy substratum
Soil No.: S61Nebr-79-1



Parent material: Alluvium.
Physiography: North Platte Valley terrace.
Relief: 0 to 2 feet.
Drainage: Somewhat excessive.
Elevation: 4,130 feet.
Ground water: Very deep; farm operator states ground water is located in fissures of the underlying Brule formation.
Slope: Less than 1 percent.
Moisture: Moist.
Erosion: Slight.
Root distribution: Plentiful to 9 inches; few to 73 inches.
Permeability: Moderately rapid.
Land use: Irrigated corn. 200 pounds of 21-53-0 fertilizer were applied to each acre of the soil early in the spring. In addition, barnyard manure at the rate of 10 spreader loads per acre was applied and plowed under.
Date: August 28, 1961. Described by: Donald A. Yost.

Horizon and Lincoln Lab. Number	
Alp 15675	0 to 9 inches. Grayish brown (10YR 5.5/2 dry) fine sandy loam, dark grayish brown (10YR 4/2) when moist; weak fine granular structure; soft when dry, very friable when moist; noncalcareous; abrupt smooth boundary.
A1 15676	9 to 17 inches. Color, texture and consistence as in above horizon; weak medium prismatic structure; noncalcareous; gradual smooth boundary.
AC 15677	17 to 26 inches. Light brownish gray (10YR 6/2 dry) fine sandy loam, dark grayish brown (10YR 4/2) when moist; weak medium prismatic structure; soft when dry, very friable when moist; noncalcareous; clear wavy boundary.
C1ca 15678	26 to 37 inches. Light gray (10YR 6.5/2 dry) fine sandy loam, grayish brown (10YR 4.5/2) when moist; massive; soft when dry, very friable when moist; slightly calcareous; clear wavy boundary.
C21ca 15679	37 to 41 inches. Light gray (10YR 7/2 dry) very fine sandy loam, grayish brown (10YR 5/2) when moist; weak fine subangular blocky structure; soft when dry, very friable when moist; very strongly calcareous; clear wavy boundary.
C22ca 15680	41 to 53 inches. White (10YR 8/2 dry) very fine sandy loam, pale brown (10YR 6/2.5) when moist; weak fine subangular blocky structure; slightly hard when dry, friable when moist; very strongly calcareous; gradual wavy boundary.
C31 15681	53 to 63 inches. Very pale brown (10YR 8/3 dry) fine sandy loam, brown (10YR 5/3) when moist; weak fine subangular blocky structure; soft when dry, very friable when moist; very strongly calcareous; gradual wavy boundary.
C32 15682	63 to 73+ inches. This is an arbitrary separation made because of the unusual thickness of the material between 53 and 73 inches. Soil characteristics are as given in the horizon above.

Note: Krotovinas, 2 to 3 inches in diameter, are present at depths of 30 to 42 inches. Mycelial lime is evident in the lower two horizons. Depth to violently effervescent lime varies from 26 inches to 43 inches on north wall of pit. Farm operator states mixed sand and gravel are present at a depth of about 15 feet at this location. Gravel is dry. The very fine sands include approximately 30 percent quartz, 20 percent identified feldspar, 30 percent highly altered grains, and 15 percent glass shards. The pattern of feldspar alteration changes little with depth. Some grains are thought to be altered glass. The index of refraction of these grains is less than that of clove oil. A minor portion of the glass appears to be obsidian. Accessory minerals in order of decreasing abundance are hornblende, pyroxene (subrounded, greenish, perhaps diopside), epidote-zoisite, zircon, garnet, and mica. A few grains of primary carbonate occur in the lower part of the profile. (Method 7B1)

SOIL SURVEY LABORATORY Mandan, N. Dak.

OIL TYPE Tripp loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-6-(1-7) **LAB. NOS.** 1973-1979

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-4	A1p1	2.5	5.4	4.7	9.2	33.6	30.7	13.9	61.6	8.0	2	vfsl
4-11	A1p2	2.4	5.6	5.0	9.2	32.7	31.4	13.7	60.6	8.8	0	vfsl

Soil type: Tripp loam
Soil No.: S53Nebr-79-6-(1-8)
Date sampled: October 2, 1953
Location: 0.3 mile east, 125 feet north of SW corner Sec. 12, T22N R54W, Scotts Bluff County, Nebraska.
Topographic position: High terrace, profile developed in loess over gravels of middle Pleistocene age.
Relief: Slight, sample site on smooth slope less than 1 percent, flat.
Drainage: Well drained. Described by: John Elder.
Ground water: Many feet below surface.
Root distribution: Normal above 27 inches. 27-37 inch horizon had a limiting effect. Roots penetrate this horizon but growth is restricted.
Land use: Irrigated from ditch--beans 1953. Harvested prior to sampling, no yield figure available, but adjacent areas indicate high yields of corn, sugar beets, beans and alfalfa can be expected on areas having profiles similar to the site sampled.

Mandan

Lab.No.	Horizon	
1973	Alp1	0-4 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam. Moder-

ate very coarse subangular blocky to moderate fine and very fine granular, hard dry, friable moist, noncalcareous, a few medium and coarse gravel scattered on surface. Clear, smooth boundary.

1974	Alp2	4-11 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam. Weak coarse subangular blocky to fine and very fine moderate granular, hard dry, friable moist, crushes to slightly lighter color, noncalcareous. Abrupt, smooth boundary.
1975	B21	11-16 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay loam; weak coarse prismatic to moderate fine granular, hard dry, friable moist, noncalcareous, many worm casts and insect holes, a few coarse sand grains and small gravel; clear, smooth boundary.
1976	B22	16-21 inches. Grayish brown (10YR 5/2.5 dry) to very dark grayish brown (10YR 3.5/2 moist) silty clay loam. Coarse moderate subangular blocky to fine and very fine strong granular, hard dry, friable moist, numerous coarse sand grains and a few small gravel, some worm casts and insect openings; gradual, smooth boundary.
1977	B3	21-27 inches. Grayish brown (10YR 5/2.5 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam; coarse weak subangular blocky to fine and very fine weak granular, soft dry, very friable moist, noncalcareous, faintly darker coatings on some aggregates, few coarse sand grains and an occasional small granitic gravel; abrupt, wavy boundary.
1978	Cca	27-37 inches. White (10YR 8/2 dry) to light grayish brown (10YR 6.5/2 moist) silt loam. Moderate thick platy to moderate medium and fine granular in upper part, weak coarse subangular blocky to weak fine granular, soft dry, very friable moist, many fine white lime spots and coatings on aggregates, some fine brown organic stains and decaying roots in root openings, violent effervescence; permeability is slow. This horizon is characteristic of the Tripp soils on this terrace level. The depth to and thickness of this horizon is variable. It is a genetic horizon and the variations of thickness and depth from the surface are probably significant in the use and management of the soils. Clear, wavy boundary.
1979	C1	37-52 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) very fine sandy loam or loam. Massive to single grain, soft dry, very friable moist, few fine white lime specks, violent effervescence; abrupt, smooth boundary.
--	D	52-60+ inches. Not sampled for laboratory. Fine and medium sand and fine to coarse gravel, limy coating on sand and gravels.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Tripp loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-7-(1-7) **LAB. NOS.** 1980-1986

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (<19mm)	
0-7	A1p	0.4	1.6	2.0	8.0	41.0	27.2	19.8	62.6	11.5	Tr.	vfsl
7-13	A12	0.7	1.5	1.9	7.8	39.8	28.8	19.5	62.9	11.5	Tr.	vfsl
13-20	B21	0.2	2.0	2.6	9.3	41.1	27.9	16.9	65.3	10.4	1	vfsl
20-30	B22	0.5	2.1	3.2	9.9	40.8	28.7	14.8	65.5	10.9	1	vfsl
30-35	B3	0.6	2.0	2.8	8.5	40.7	32.2	13.2	66.2	12.7	1	vfsl
35-45	Cca	-	0.4	1.1	3.5	40.0	48.2	6.8	70.2	20.9	-	vfsl
45-63	C1	0.3	1.9	3.0	8.4	37.4	38.8	10.2	67.2	14.6	1	l

pH			ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC x 10^3 MILLIMHOS PER CM 8A1a	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
7.5	7.9	8.0	0.84			a	0.7	-				10.0
7.4	7.7	7.5	0.71				0.7	-				9.9
7.3	7.5	7.2	0.56				0.8	-				8.9

Soil type: Tripp loam
Soil No.: 853Nebr-79-7-(1-8)
Date sampled: October 2, 1953
Location: Twelve hundred feet south and 100 feet east of NW corner Sec. 19, T22N R53W, Scotts Bluff County, Nebraska
Topographic position: High terrace, profile developed in loess over gravels of middle Pleistocene age.
Relief: Slight, sample site on smooth slope of less than 1 percent, flat.
Drainage: Well drained. Described by: John Elder.
Ground water: Many feet below surface.
Root distribution: Normal above 35 inches. 35 to 45 inch horizon has a limiting effect. Roots penetrate this horizon but growth is restricted.
Land use: Irrigated from ditch--beans 1953. Crops on adjacent areas indicate high yields of adapted crops.

Mandan
Lab.No. Horizon

[redacted]

abrupt, smooth boundary.

1981 A12 7-13 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam. Coarse weak subangular blocky to fine moderate blocky and granular, hard dry, friable moist, a few coarse sand grains, noncalcareous, numerous worm casts and insect openings. Clear, smooth boundary.

1982 B21 13-20 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay loam. Weak coarse prismatic to moderate fine granular, hard dry, friable moist, crushes to slightly lighter color, noncalcareous, many large insects and root openings. Gradual, smooth boundary.

1983 B22 20-30 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam. Weak coarse prismatic to moderate fine subangular blocky and moderate fine granular, hard dry, friable moist, noncalcareous, few coarse sand grains and fine gravel. Gradual, wavy boundary.

1984 B3 30-35 inches. Light gray (10YR 7/2 dry) to grayish brown (10YR 5/2 moist) silt loam. Weak coarse subangular blocky to moderate fine and very fine granular, soft dry, very friable moist,

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Ulysses **LOCATION** Scotts Bluff County. Nebraska

silt loam

SOIL NOS. S53Nebr-79-1-(1-8) **LAB. NOS.** 1939-1946

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-5	A1p	-	0.3	0.2	2.8	35.0	41.1	20.6	62.8	35.5	-	1

Date: September 30, 1953.
Location: 0.3 mile north of SE corner Sec. 36, T22N R58W, Scotts Bluff County, Nebraska.
Topographic position: Loess covered upland (Peorian and later).
Relief: Slight, smooth 2 percent slope, northeast facing.
Drainage: Well drained.
Ground water: Many feet below surface.
Root distribution: Normal throughout. No limiting horizons.
Land use: Dryland wheat 1953. Stubble indicates high yield for area.
Soil type: Ulysses silt loam
Soil No.: S53Nebr-79-1-(1-8) Described by: John Elder.
Mandan

Lab.No.	Horizon	
1939	Alp	0-5 inches. Grayish brown (10YR 5.5/2 dry) to dark grayish brown 10YR 4/2 moist) silt loam. Weak coarse subangular blocky to weak fine granular, tendency toward very thick platy; hard dry, friable moist, abundant roots, noncalcareous, abrupt, smooth boundary.
1940	B21	5-10 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam. Moderate very coarse prismatic breaking to moderate fine granular; hard dry, friable moist, abundant roots which penetrate aggregates but tend to follow aggregate planes, worm holes and casts numerous, noncalcareous, clear, irregular boundary.
1941	B22	10-15 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) silty clay loam. Weak medium prismatic breaking to weak fine subangular blocky and weak very fine granular, hard dry, friable moist, abundant roots, noncalcareous, clear, wavy boundary.
1942	Cca	15-21 inches. White (10YR 8/2.5 dry) to pale brown (10YR 6/2.5 moist) silt loam. Moderate, coarse subangular, blocky to weak fine granular, slightly hard dry, friable moist, violent effervescence, white lime coatings in pores and root openings; fine roots abundant, diffuse, wavy boundary.
1943	C1	21-27 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to weak fine and medium subangular blocky, soft dry, very friable moist, few faint lime coatings along root channels and pore openings, violent effervescence, diffuse wavy boundary.
1944	C2	27-34 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Very weak coarse subangular blocky to very weak fine subangular blocky and very weak very fine granular, soft dry, very friable moist, violent effervescence, few fine roots, numerous very fine pores, diffuse, wavy boundary.
1945	C3	34-43 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Massive to single grain, soft dry, very friable moist, violent effervescence, few fine white specks of carbonates in pore openings, few fine roots, numerous very fine pore openings, diffuse, wavy boundary.
1946	C4	43-60+ inches. Very pale brown (10YR 8/3 dry) to 10YR 6/3 moist silt loam or very fine sandy loam, massive to single grain or very weak fine crumb, soft dry, very friable moist, violent effervescence, few fine roots, numerous very fine pores. Continues downward to an undetermined depth where the loess rests on unweathered Brule formation.

SOIL SURVEY LABORATORY Mundan, N. Dak.a/ 9/21/55

SOIL TYPE Valentine fine sand **LOCATION** Arthur County, Nebraska

SOIL NOS. S54Nebr-3-2-(1-4) **LAB. NOS.** 2436-2439

DEPTH INCHES	HORIZON	1B1b PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-4	A1	0.1b	2.6	12.1	58.8	18.7	3.6	4.1	58.3	1.8	-	fs
4-8	AC	-	1.8	10.0	60.6	22.5	1.7	3.4	65.7	0.9	-	fs
8-14	C1	-	2.2	11.5	60.8	21.2	1.3	3.0	63.0	0.6	-	fs
14-60	C2	-	2.1	11.3	61.9	21.3	0.2	3.2	63.3	0.2	-	fs

DEPTH INCHES	pH 8C1b SATURATED PASTE	pH 8C1a 1:5	pH 8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	ORGANIC MATTER 6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10³ MILLIMHOS PER CM	$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 4B1a 1/10 ATMOS. %	4B1a 1/3 ATMOS. %	4B2 15 ATMOS. %
0-4	6.7	7.2	7.3	0.76	.058	13.1					7.6	4.6	3.1
4-8	6.7	7.4	7.4	0.44	.037	11.9					5.8	3.4	2.7
8-14	6.9	6.9	7.0	0.28	.025	11.2					4.8	2.9	2.0
14-60	6.7	6.9	6.9	0.13							4.3	2.6	1.6

DEPTH INCHES	5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5B1a 6N2b Ca	6G2b Mg	H	6P2a Na	6Q2a K	BASE SAT. % 5C1	Na	K	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	←	milliequivalents per 100g. soil				→						
0-4	5.2	3.3	0.7		0.1	0.5	88			4.6	4.7	
4-8	4.0	2.6	0.8		0.1	0.3	95			3.8	3.2	
8-14	3.4	2.4	0.3		0.1	0.2	88			3.0	8.0	
14-60	3.0	2.0	0.5		0.1	0.2	93			2.8	4.0	

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Valentine fine sand
Soil No.: S54Nebr-3-2-(1-4)
Location: 12.1 miles north of Arthur, Arthur County, Nebraska on Arthur-Hyannis road; 900 feet north and 110 feet east of southwest corner Sec. 4, T20N, R38W.
Topography: On northwest facing slope of about 5 percent gradient, bordering a "sandhill" valley. A large grove of cottonwood trees about .5 mile west-northwest of the sample site.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2436	A_1	0-4"	Dark grayish brown(10YR 4.5/2, dry) to very dark grayish brown (10YR 3/2, moist) fine sand; single grained; slightly hard, dry but crushes easily between fingers; very friable, moist; clear smooth lower boundary.
2437	AC	4-8"	Grayish brown (10YR 5/2, dry) to dark grayish brown (10YR 4/2, moist) fine sand; single grained; loose, dry and moist; except a few slightly hard lumps when spaded out, dry; clear smooth lower boundary.
2438	C_1	8-14"	Brown (10YR 5/2.5, dry) to brown (10YR 4.5/3, moist) fine sand; single grained; slightly hard or slight resistance to digging when dry; very friable, moist; gradual smooth lower boundary.
2439	C_2	14-60"	Pale brown (10YR 6/3, dry) brown (10YR 4.5/3, moist) fine sand; same as above except seemingly a fraction lighter-colored.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/21/55

SOIL TYPE Valentine fine sand **LOCATION** Cherry County, Nebraska

SOIL NOS. S54Nebr-16-1-(1-5) **LAB. NOS.** 2440-2444

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
		1B1b VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	
0-4	A1	0.2b	4.2	12.7	50.2	24.7	4.1	3.9	61.0	1.8	-	fs
4-10	AC	0.1	4.6	13.3	55.1	21.6	2.2	3.1	60.7	0.8	-	fs
10-18	C1	-	3.6	11.2	56.2	24.0	1.8	3.2	64.3	1.7	-	fs
18-32	C2	-	4.4	18.6	58.9	14.7	1.0	2.4	51.0	0.3	-	fs
32-54	C3	0.1	3.8	10.9	59.1	22.1	1.3	2.9	64.4	0.6	-	fs

	pH		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY EC x 10^3 MILLIMHOS PER CM			MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)		$CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	4B1a 1/10 ATMOS. %	4B1a 1/3 ATMOS. %	4B2 15 ATMOS. %
6.0	6.4	6.5	0.98	.092	10.6					9.8	5.8	4.0
6.2	6.6	6.6	0.46	.040	11.5					6.2	3.7	2.5
6.5	6.7	6.6	0.22	.021						5.6	3.1	2.0
6.7	6.9	6.7	0.09							3.6	2.1	1.4
6.8	7.0	6.9	0.07							4.8	2.7	1.6

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 5A1a					BASE SAT. %			5A3a	8D3		MOISTURE AT SATURATION %
	6B2b Ca	6G2b Mg	H	6P2a Na	6Q2a K	5C1	Na	K	Sum Cations me/100g	Ca/Mg		
	milliequivalents per 100g. soil											
5.9	3.6	0.6		0.1	0.3	78			4.6	6.0		
3.7	2.1	0.4		0.1	0.3	78			2.9	5.2		
3.3	2.0	0.6		0.1	0.2	88			2.9	3.3		
2.4	1.5	0.2		0.1	0.1	79			1.9	7.5		
2.8	1.8	0.8		0.1	0.2	100			2.9	2.2		

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Valentine fine sand
Soil No.: S54Nebr-16-1-(1-5)
Location: 250 feet south and 270 feet east of point where road crosses section line; north side Sec. 25, T26N, R28W; on U. S. Highway 83, 16.4 miles north of junction with Nebraska Highway 2, east of Thedford, Cherry County, Nebraska.
Topography: On short northwest facing slope of about 10 percent gradient. Farmstead and grove of trees .5 mile to the northwest in a "dry" valley.
Described by: B. H. Williams.

Mandan Lab. No.	Horizon	Depth	
2440	A_1	0-4"	Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2.5/2, moist) fine sand. Single grained; soft, dry with sufficient coherence to break into soft lumps; loose, moist; clear smooth boundary.
2441	AC	4-10"	Brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) fine sand. Single grained, soft, dry with sufficient coherence to form soft lumps; loose, moist; clear smooth boundary.
2442	C_1	10-18"	Pale brown (10YR 6/3, dry) to dark brown (10YR 4/3, moist) fine sand, single grained; soft, dry; loose, moist; gradual smooth boundary.
2443	C_2	18-32"	Light gray (10YR 7/2, dry) to grayish brown ($10YR^R$ 5.5/2, moist) fine sand. Similar to above with slightly lighter and grayer colors.
2444	C_3	32-54"	Light brownish gray (10YR 6/2.5, dry) to grayish brown (10YR 5/2.5, moist) fine sand; single grained; soft, dry, loose and very friable, moist. Seems to differ from the horizon above mainly or only in that there are two dark yellowish brown (moist) irregularly wavy thin seams or lenses ($10YR^R$ 6/3, dry; 4.5/3, moist) of slightly clayey sand, probably loamy fine sand in this horizon. The upper lense was about 1/4-inch thick, the lower one about 1/2-to 3/4-inches thick. This material has a slightly firm moist consistence.

SOIL SURVEY LABORATORY Mandan, N. Dak. a/ 9/20/55

SOIL TYPE Valentine fine sand **LOCATION** Cherry County, Nebraska

SOIL NOS. S54Nebr-16-2-(1-5) **LAB. NOS.** 2445-2449

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 1B1b VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-4	A1	-	1.9	10.5	59.9	18.6	4.3	4.8	61.7	1.5	-	fs
4-8	AC	0.1	2.5	10.4	57.3	21.5	3.1	5.1	63.6	1.2	-	fs
8-16	C1	0.1	2.8	8.2	63.3	19.3	1.0	5.3	66.3	0.4	-	fs
16-39	C2	-	1.5	11.7	64.1	16.8	0.8	5.1	61.4	0.3	-	fs
39-60	C3	-	1.3	18.6	70.4	6.5	0.6	2.6	41.6	0.2	-	fs

DEPTH INCHES	pH 8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10^3 MILLIMHOS PER CM	$CoCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 4B1a 1/10 ATMOS. %	4B1a 1/3 ATMOS. %	4B2 15 ATMOS. %
0-4	6.2	6.6	6.6	0.90	.078	11.5					9.8	5.6	3.3
4-8	6.6	6.9	6.7	0.52	.045	11.6					7.5	4.9	3.0
8-16	6.6	7.1	6.9	0.24	.021						6.5	4.3	2.6
16-39	6.8	7.1	6.9	0.11							6.8	4.4	2.4
39-60	6.7	7.1	6.7	0.06							3.4	2.1	1.3

DEPTH INCHES	5A1a CATION EXCHANGE CAPACITY NH_4 Ac	EXTRACTABLE CATIONS 6B2b Ca	6G2b Mg	H	6B2a Na	6G2a K	BASE SAT. % 5C1	Na	K	5A3a Sum Cations me/100g	8D3 Ca/Mg		MOISTURE AT SATURATION %
	← milliequivalents per 100g. soil →												
0-4	6.1	4.1	0.8		0.1	0.3	87			5.3	5.1		
4-8	5.4	3.7	0.6		0.1	0.3	87			4.7	6.2		
8-16	4.6	3.2	0.9		0.1	0.3	98			4.5	3.5		
16-39	4.3	2.8	0.6		0.1	0.3	88			3.8	4.7		
39-60	2.3	1.5	0.5		0.1	0.2	100			2.3	3.0		

a. Particle size analyses by Beltsville Laboratory.

Soil type: Valentine fine sand
Soil No.: S54Nebr-16-2-(1-5)
Location: Near northeast corner of southeast quarter of northeast quarter, Sec. 23, T27N, R28W; 230 feet west and 50 feet south of fence corner that is located 480 feet west of Highway 83 adjacent to ranch road, (Richardson Ranch) leading west .9 mile north of Brownlee road junction with Highway 83. 23.1 miles north on U. S. Highway 83, from its junction with Nebraska Highway 2, east of Thedford, Cherry County, Nebraska.
Topography: West facing slope of undulating and gently rolling area lying south and east of broad irregularly shaped valley; a large farmstead spread about .5 mile north of location.
Described by: B. H. Willians.

Mandan Lab. No.	Horizon	Depth	
			dry; very friable, moist; clear smooth lower boundary.
2446	AC	4-8"	Brown (10YR 5/3, dry) to dark grayish brown(10YR 4/2, moist fine sand; single grained; slightly hard, slight resistance to digging, when dry; loose friable, moist; clear smooth lower boundary.
2447	C_1	8-16"	Brown (10YR 5.5/3, dry) to brown (10YR 5/3, moist) fine

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Volin very fine sandy loam LOCATION Saunders County, Nebraska

SOIL NOS. S53Nebr-78-2-(1-8) LAB. NOS. 1482-1489

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-6	A1p	-	-	0.2	1.3	19.3	65.3	13.9	[illegible].2	14.4	-	sil
6-11	A12	-	-	0.2	1.2	23.8	59.6	15.2	69.7	14.6	-	sil
11-15	AC	-	-	-	0.6	22.8	63.6	13.0	72.3	14.6	-	sil
15-24	C1	-	-	-	0.5	18.7	68.2	12.6	72.1	15.2	-	sil
24-32	C2	-	-	0.2	0.8	20.0	70.4	8.5	81.4	9.4	-	sil
32-39	Cca	0.4	0.3	0.1	-	6.8	74.5	17.7	57.9	23.4	-	sil
39-48	C3	-	-	-	0.9	51.8	42.0	5.3	90.4	4.1	-	vfsl
48-66	C4	0.5	0.3	-	-	2.4	76.8	20.0	39.6	39.6	-	sil

pH [illegible] ORGANIC MATTER 8A2 ELECTRICAL 6E1a 6F1a MOISTURE TENSIONS

Soil type: Volin very fine sandy loam
Soil No.: S53Nebr-78-2-(1-8)
Location: One-fourth mile south and 100 feet west of NE corner Sec. 26, T13N, R9E, Saunders County, Nebraska
Topographic position: Platte River bottom land above flood level of the river but may be occasionally flooded by local drains.
Relief: Slight, on slightly elevated position with respect to surrounding area.
Drainage: Moderately well drained to well drained.
Ground water: Below 6 feet, probably 8 to 10 feet below the surface but is known to fluctuate to about 5 feet below the surface in some years.
Land use: Cultivated. Capable of producing high yields of corn and alfalfa.
Described by: B. H. Williams and Donald C. Yost.

Mandan

Lab. No.	Horizon	
1482	A1p	0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) very fine sandy loam; weak thick platy breaking to moderate fine granular; soft, dry; friable, moist; noncalcareous; abrupt smooth lower boundary.
1483	A12	6-11 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; weak coarse subangular blocky breaking to strong fine granular; slightly hard, dry; friable, moist; noncalcareous; many fine and medium pores and openings; clear smooth lower boundary.
1484	AC	11-15 inches. Grayish brown and light brownish gray (10YR 5/2 and 6/2 dry) to dark gray and grayish brown (10YR 4/2 and 5/2 moist) silt loam soil from horizons above and below mixed by worms in about equal amounts of the lighter and darker colors; moderate coarse subangular blocky breaking to strong medium and fine granular; slightly hard, dry; friable, moist; numerous fine pores and openings; noncalcareous. Smooth clear lower boundary.
1485	C1	15-24 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) silt loam; massive, but separates into weak fine granular or crumb-like particles; soft, dry; very friable, moist; many fine pores and openings; noncalcareous; clear smooth lower boundary.
1486	C2	24-32 inches. Light gray or nearly white (2.5Y 7.5/2 dry) to grayish brown (2.5Y 5/2 moist) very fine sandy loam; massive, soft, dry; very friable, moist; many medium and fine pores and openings; noncalcareous, pH 7.5 (Soiltex); clear smooth lower boundary.
1487	Cca	32-39 inches. Light gray or nearly white (2.5Y 7.5/2 dry) to grayish brown (2.5Y 5/2 moist) silt loam, dark grayish brown (2.5Y 4/2 moist) containing some worm casts and a few coarse brown mottles; massive; soft, dry; very friable, moist; many medium and fine pores and openings; violent effervescence, pH 7.5, numerous fine white streaks and spots of lime; clear smooth lower boundary.
1488	C3	39-48 inches. Light gray or nearly white (2.5Y 7.5/2 dry) to light brownish gray (2.5Y 6/2 moist) loamy very fine sand, common faint fine and coarse brown mottles and very thin dark-colored lenses; massive, soft, dry; very friable, moist; weak effervescence, pH 7.5; gradual smooth lower boundary.
1489	C4	48-66 inches. Light gray (10YR 7/1 dry) to gray (10YR 5/1 moist) silt loam and sandy loam, stratified with very thin lenses of nearly white very fine sandy loam and nearly black silty clay loam; massive; soft, dry; very friable, moist; weak effervescence, pH 7.5; clear smooth lower boundary.
	A1b	66-70+ inches. This horizon not sampled for laboratory analysis. Very dark gray or nearly black silty clay loam.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1959

SOIL TYPE Wabash silty clay loam LOCATION Pawnee County, Nebraska

SOIL NOS. S58Nebr-67-4-(1-6) LAB. NOS. 9156-9161

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-5	A1p	<0.1	0.3a	0.4a	0.9b	1.3b	65.2	31.9	31.2	35.8	-	sicl
5-11	A12	0.1a	0.4a	0.4a	0.8b	1.0b	62.3	35.0	26.5	37.2	-	sicl
11-22	A13	0.3a	0.4a	0.4a	0.5b	0.9b	58.3	39.2	22.8	36.7	-	sicl
22-35	A3	0.2a	0.2a	0.2a	0.6b	0.8b	54.3	43.7	19.4	36.1	-	sic
35-48	C1	0.4a	0.2a	0.1a	0.4b	0.5b	49.7	48.7	14.0	36.5	-	sic
48-63	C2	0.1a	0.2a	0.2a	0.6b	0.7b	50.7	47.5	14.5	37.3	-	sic

pH			ORGANIC MATTER			6C1a	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1a			6A1a	6B1a		Free Iron as $\%Fe_2O_3$	EC×10³ MILLIMHOS PER CM	$CaCO_3$ equivalent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.
	1:5	1:10	ORGANIC CARBON	NITROGEN	C/N							
			-	-				-		-	-	-

Soil Type: Wabash silty clay loam
Classification: Alluvial
Location: 150 feet south and 0.2 mile east of center of Sec. 11, T1N, R11E, located about 3 miles south of Pawnee City, Pawnee County, Nebraska.
Date Sampled: September 12, 1958.
Collectors: R. Jordan, R. Greenawalt.
Use: Cultivated (corn 1958).
Climate: Average annual precipitation 31 inches: average annual temperature 53° F.

Parent Material: Alluvium.
Physiography: Bottom land.
Slope: Less than 1 percent.
Drainage: Slow.
Ground Water: Below 5 feet.
Soil No.: S58Nebr-67-4-(1-6)
Lincoln

Lab.No.	Horizon	
9156	A1p	0-5 inches. Very dark gray (10YR 3/1 dry) to black (10YR 2/1 moist) silty clay loam; moderate and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9157	A12	5-11 inches. Very dark gray (10YR 3/1 dry) to black (2.5Y 2/0 moist) heavy silty clay loam; moderate medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; gradual smooth lower boundary.
9158	A13	11-22 inches. Very dark gray (10YR 3/1 dry) to black (2.5Y 2/0 moist) silty clay; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9159	A3	22-35 inches. Black (10YR 2/1 dry) to black (2.5Y 2/0 moist) silty clay; weak medium and fine blocky structure with clay films on the aggregate faces; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary.
9160	C1	35-48 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay; weak coarse blocky structure with clay films and the sides of the blocks are slicked at a 45° angle; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary.
9161	C2	48-63 inches. Dark gray (10YR 4/1 dry) to very dark grayish brown (10YR 3/2 moist) silty clay; weak coarse blocky structure with clay films and the sides of the blocks are slicked at a 45° angle; very hard dry, very firm moist; noncalcareous but with a few medium hard lime concretions.

Note: Horizons A1p, A13 and C2 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1959

SOIL TYPE Wabash silty clay loam **LOCATION** Pawnee County, Nebraska

SOIL NOS. S58Nebr-67-8-(1-7) **LAB. NOS.** 9185-9191

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-7	A1p	0.1	0.3	0.5	1.3a	1.5a	62.7	33.6	28.6	36.3	-	sicl
7-13	A12	<0.1	0.2b	0.4b	1.1b	1.3c	62.7	34.3	26.4	38.2	-	sicl
13-22	A13	<0.1	0.1b	0.3b	0.6b	0.7c	50.1	48.2	15.9	35.2	-	sic
22-36	A14	0.1b	0.2b	0.1b	0.3b	0.5c	49.2	49.6	15.2	34.7	-	sic
36-44	A31	<0.1	0.1b	0.1b	0.2b	0.4c	52.2	47.0	16.0	36.7	-	sic
44-52	A32	0.1b	0.2b	0.1b	0.2b	0.5c	50.1	48.8	17.4	33.3	-	sic
52-60	C	<0.1	0.4d	0.4d	0.6d	0.4e	49.0	49.2	15.4	34.3	-	sic

Soil Type: Wabash silty clay loam
Classification: Alluvial
Location: 500 feet east and 160 feet south of center of Sec. 21, T2N, R11E, located about 2 miles west and 1 mile north of Pawnee City, Pawnee County, Nebraska.
Date Sampled: September 16, 1958.
Collectors: J. Allen, J. Elder, R. Greenawalt.
Use: Cultivated (red clover).
Climate: Average annual precipitation 31 inches; average annual temperature 53° F.
Parent Material: Alluvium.
Physiography: Bottom land.
Drainage: Slow.
Slope: Less than 1 percent.
Ground Water: Deeper than 5 feet.
Soil No.: S58Nebr-67-8-(1-7)
Lincoln

Lab.No.	Horizon	
9185	A1p	0-7 inches. Very dark brown (10YR 2/2 dry) to very dark brown (10YR 2/2 moist) silty clay loam; moderate fine and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9186	A12	7-13 inches. Very dark gray (2.5Y 3/0 dry) to black (2.5Y 2/0 moist) silty clay loam; moderate fine granular structure; slightly hard dry, friable moist; noncalcareous; gradual smooth lower boundary.
9187	A13	13-22 inches. Very dark gray (2.5Y 3/0 dry) to black (10YR 2/1 moist) silty clay; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9188	A14	22-36 inches. Very dark gray (10YR 3/1 dry) to black (10YR 2/1 moist) silty clay; moderate medium and fine blocky structure; some of the blocks are slicked; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9189	A31	36-44 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay; moderate coarse blocky structure; the sides of the blocks are slicked and at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9190	A32	44-52 inches. Dark gray (5Y 4/1 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay; moderate coarse blocky structure; the sides of the blocks are slicked at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9191	C	52-60 inches. Dark gray (5Y 4/1 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay; moderate coarse blocky structure; the sides of the blocks are slicked at a 45° angle; hard dry, firm moist; calcareous.

Note: Horizons A1p, A13 and C were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Wann silt loam **LOCATION** Hall County, Nebraska

SOIL NOS. S53Nebr-40-3-(1-5) **LAB. NOS.** 1566-1570

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 1B1a: VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	8A1: 0.2-0.02	0.02-0.002	2A2: > 2 (<19mm)	TEXTURAL CLASS
0-6	A1p	4.0	11.4	10.2	11.1	13.7	35.5	14.1	45.7	8.5	1	l
6-15	A12	9.1	17.7	15.7	15.8	8.3	20.8	12.6	30.6	5.3	4	cosl
15-20	A13	8.5	20.6	18.2	17.9	8.0	16.2	10.6	27.4	4.7	3	cosl
20-27	AC	10.3	20.6	19.3	20.6	7.5	13.2	8.5	26.1	3.9	2	cosl
27-32	C	24.6	26.2	17.8	17.0	4.6	5.3	4.5	15.3	1.1	.8	cos

pH: 8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	ORGANIC MATTER 6A1a: ORGANIC CARBON %	NITROGEN %	C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS: 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
8.1	8.4	8.5	1.25			a	1.1	2				7.6
8.4	8.8	8.9	0.76				1.0	4				7.1
8.5	8.9	9.0	0.37				0.9	2				6.3
8.0	8.2	7.7	0.14				0.8	1	-			4.7
8.0	7.4	7.0	0.07				0.7	-	-			2.2

5A1a CATION EXCHANGE CAPACITY NH_4Ac	5B1a CATIONS EXTRACTABLE: Ca	Mg	5B1b EXCHANGEABLE: 6P2a Na	6Q2a K	5D2 EXCH. Na %	8A1 SATURATION EXTRACT SOL.: 6P1a Na	6Q1a K	8A MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →					← milliequivalents per liter →		
13.9			0.4	1.0	3	3.0	0.8	35.9
9.7			0.7	0.4	7	6.7	0.1	32.0
8.2			1.0	0.2	12	7.4	0.1	28.4
7.0			0.7	0.2	10	6.7	-	23.6
3.4			0.3	0.1	9	5.2	-	19.5

a. Less than 0.20%.

Soil type: Wann silt loam
Soil No.: S53Nebr-40-3-(1-6)
Location: One hundred and fifty feet northeast of south 1/4 corner Sec. 1, T10N, R10W, Hall County, Nebraska
Topographic position: Nearly level Platte River bottom land above overflow.
Drainage: Moderately well drained.
Use: Cultivated. Corn, 1952.
Described by: B. H. Williams and Donald C. Yost.

Mandan Lab.No.	Horizon	
1566	A1p	0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate fine and very fine granular; soft, dry; friable, moist; strong effervescence; abrupt smooth lower boundary.
1567	A12	6-15 inches. Very dark gray (10YR 3.5/1 dry) to nearly black (10YR 2.5/1 moist) silt loam or loam; containing a few fine gravel; strong fine and very fine granular; soft, dry; friable, moist; violent effervescence; clear smooth lower boundary.
1568	A13	15-20 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) loam; containing a few fine gravel, moderate fine granular; soft, dry; friable, moist; violent effervescence; clear smooth lower boundary.
1569	AC	20-27 inches. Gray (10YR 5/1.5 dry) to dark gray (10YR 4/1 moist) fine sandy loam; moderate fine granular; soft, dry; very friable, moist; weak effervescence in upper part; clear smooth lower boundary.
1570	C	27-32 inches. Light brownish gray (10YR 6/2 dry) to grayish brown (10YR 5/2 moist) loamy sand; single grained, loose, noncalcareous; gradual wavy lower boundary.
	D	32-40+ inches. Not sampled for Mandan laboratory. Very pale brown sand and fine gravel; loose, noncalcareous; water table at about 60 inches. At about 60 inches plus is a horizon with prominent brown mottlings. Little or no mottling above 60 inches to indicate restriction in drainage above the water table.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Wann silt loam **LOCATION** Hall County, Nebraska

SOIL NOS. S53Nebr-40-2-(1-6) **LAB. NOS.** 1560-1565

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2	TEXTURAL CLASS
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (19mm)	
0-7	A1p	2.6	7.1	7.2	12.4	20.7	35.1	14.9	54.3	8.3	Tr.	l
7-12	A12	2.6	8.6	8.4	15.3	19.3	32.7	13.1	53.7	6.8	1	fsl
12-17	A13	7.2	13.0	10.2	15.4	22.8	24.7	6.7	50.6	5.0	2	sl
17-21	C1	4.3	9.0	8.9	16.6	28.8	26.2	6.2	60.1	4.4	1	fsl
21-27	C2	5.7	11.2	10.1	15.4	32.4	20.5	4.7	57.9	3.4	2	ls
27-35	D	25.5	29.6	19.2	15.7	5.3	3.5	1.2	14.9	0.4	6	cos

8C1b SATURATED PASTE	pH 8C1a 1:5	8C1a 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	NITROGEN %	C/N	8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
8.1	8.7	9.0	1.19			a	1.2	5				8.5
8.3	8.7	8.9	0.91				1.1	5				7.3
8.2	8.6	8.8	0.34				1.0	2				4.9
7.9	7.7	7.6	0.17				0.9	1	-			4.1

Soil type: Wann silt loam
Soil No.: S53Nebr-40-2-(1-6)
Location: 0.1 mile north of east 1/4 corner Sec. 8, T10N, R9W, Hall County, Nebraska.
Topographic position: Broad, slightly depressed flat of broadly undulating Platte River bottom land above overflow.
Drainage: Poorly drained.
Use: Cultivated. Corn, 1952.
Described by: B. H. Williams and Donald C. Yost.

Mandan Lab.No.	Horizon	
1560	A1p	0-7 inches. Gray (10YR 5.5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; violent effervescence, pH 8.5 (Soiltex); few coarse sand grains; abrupt smooth lower boundary.
1561	A12	7-12 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; many fine and medium pores and openings; violent effervescence; clear smooth lower boundary.
1562	A13	12-17 inches. Gray (10YR 5.5/1 dry) to very dark gray (10YR 3/1 moist) loam; weak medium and fine granular; slightly hard, dry; friable, moist; strong effervescence, pH 8.5 (Soiltex); clear smooth lower boundary.
1563	C1	17-21 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; massive or weak fine granular; soft, dry; very friable, moist; no effervescence, pH 7.2; gradual smooth lower boundary.
1564	C2	21-27 inches. Light brownish gray (10YR 6/2 dry) to grayish brown (10YR 5/2 moist) loamy fine sand or fine sandy loam; common faint fine yellowish brown mottles; massive; soft, dry; very friable, moist; noncalcareous, pH 7.0; gradual smooth lower boundary.
1565	D	27-35 inches. Light brownish gray (10YR 6/2.5 dry) to pale brown (10YR 6/3 moist) loamy sand or sand; massive, loose, noncalcareous, graded mixture largely fine sand to fine gravel with a little silt and clay; many prominent coarse brown and yellowish brown mottles; gradual smooth lower boundary.
		35+ inches. Not sampled for laboratory study. Pale brown sand and fine gravel; mottled and stained with iron, saturated, water table at 40 inches.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Wann silt loam LOCATION Hall County, Nebraska

SOIL NOS. 853Nebr-40-6-(1-5) LAB. NOS. 1586-1590

		PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)	
[illegible]	[illegible]	[illegible]	[illegible]

Soil type: Wann silt loam
Soil No.: S53Nebr-40-6-(1-5)
Location: One-fourth mile north of SW corner Sec. 36, T10N, R11W, Hall County, Nebraska.
Topographic position: Nearly level Platte River bottom land.
Relief: Slight.
Drainage: Imperfectly drained; water table at 4 feet or less and probably fluctuates between 30 and 50 inches.
Use: Cultivated.
Described by: B. H. Williams and Donald C. Yost.
Mandan

Lab. No.	Horizon	
1586	A1p	0-9 inches. Gray (10YR 5.5/1 dry) to very dark gray or dark gray (10YR 3.5/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; violent effervescence, pH 8.7 (Soiltex); abrupt smooth lower boundary.
1587	A12	9-14 inches. Gray (10YR 5.5/1 dry) to very dark gray (10YR 3.5/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; many fine and very fine pores and root channels; violent effervescence, pH 8.5; clear smooth lower boundary.
1588	AC	14-19 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; few faint fine yellowish brown mottles; strong fine granular; soft, dry; friable, moist; weak effervescence, pH 8.0; clear smooth lower boundary.
1589	C1	19-22 inches. Light brownish gray (10YR 6/2.5 dry) to dark grayish brown (10YR 4.5/2 moist) fine sandy loam; few faint fine brown mottles and stains; weak coarse subangular blocky separating to moderate medium and fine granular or crumb; soft, dry; friable, moist; noncalcareous; clear smooth [illegible]

[redacted]

many distinct fine and coarse dark brown mottles and stains; massive; soft, dry; very friable, moist; noncalcareous, pH 7.0.

28-30 inches. Not sampled. Transition from C2 to D horizon.

	D	30+ inches. Not sampled. Many soft brown iron concretions and coarse brown mottles and stains above a depth of 4 feet; water table at 46-48 inches.

SOIL SURVEY LABORATORY

Mandan, N. Dak.

SOIL TYPE Wood River silt loam

SOIL NO. S50Nebr-40-2-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 — 1B1a: VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2	TEXTURAL CLASS
283	0-6	A1p	-	0.4	0.6	1.1	16.3	63.0	18.6	15.9	64.1	-	sil
284	6-10	A12	-	0.2	0.5	0.9	11.8	68.4	18.2	20.6	60.2	-	sil
285	10-13	A2	-	0.2	0.5	1.1	14.1	68.6	15.5	21.2	62.2	-	sil
286	13-21	B21	-	0.2	0.4	0.6	7.7	56.3	34.8	18.1	46.3	-	sicl
287	21-28	B22	-	-	0.3	0.4	6.1	51.0	42.2	18.6	38.7	-	sic
288	28-30	B31sa	-	-	0.2	0.3	6.3	51.4	41.8	19.0	38.9	-	sic
289	30-38	B32	0.2	0.2	0.2	0.4	9.6	54.6	34.8	20.9	43.5	-	sicl
290	38-53	C1	0.5	0.2	0.1	0.4	11.0	60.0	27.8	23.9	47.2	-	sicl
291	53-60	C2	2.7	0.9	0.4	0.5	9.4	63.8	22.3	25.8	47.7	-	sicl

LABORATORY NUMBER	pH — SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	ORGANIC MATTER — % ORGANIC CARBON 6A1a	% NITROGEN	C/N	EST. % SALT (BUREAU CUP) 8A2	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me /100g SOIL 6F1a	MOISTURE TENSIONS — 1/10 ATMOS	(per cent) 1/3 ATMOS	15 ATMOS 4B2
283	6.8	7.3	7.4	1.47			-	0.9	tr	-			8.4
284	7.1	7.6	7.7	1.20			-	0.8	tr	-			7.8
285	7.3	7.9	8.0	0.90			-	0.7	tr	-			6.4
286	7.3	8.3	8.5	0.52			-	1.0	tr	-			16.9
287	8.0	9.0	9.2	0.35			-	1.2	tr	-			22.1
288	7.7	8.2	8.4	0.24			0.37	4.5	3	2			20.7
289	8.0	9.2	9.4	0.16			-	1.3	2	-			18.6
290	7.7	8.9	9.2	0.09			-	1.4	1	-			15.2
291	7.8	8.9	9.1	0.07			-	1.0	8	-			12.3

LABORATORY NUMBER	5A1a CATION EXCHANGE CAPACITY NH_4Ac	CATIONS — EXTRACTABLE 5B1a: 6N2b Ca	6O2b Mg	EXCHANGEABLE 5B1b: 6P2a Na	6Q2a K	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1 — 6P1a Na	6Q1a K	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
	milliequivalents per 100g soil						milliequivalents per liter						
283	17.9	11.9	3.8	0.8	2.3	5	2.1	3.0					43.1
284	16.2	12.5	3.1	0.8	1.4	5	2.4	5.3					41.3
285	13.1	9.3	2.7	1.1	1.6	9	3.7	4.7					38.1
286	24.9			4.2	3.2	17	9.6	8.8					58.2
287	32.0			4.8	4.4	15	7.7	5.4					92.0
288	32.4			2.6	3.8	8	32.5	7.5					77.1
289	30.2			4.4	4.2	15	10.6	3.2					79.2
290	27.5			2.4	4.1	9	9.5	3.2					56.8
291	23.7			1.4	3.4	6	4.6	1.3					47.4

AGR-SCS BELTSVILLE MD. 2682 JUNE 1953

Soil type: Wood River silt loam
Soil No.: S50Nebr-40-2-(1-9)
Location: 1/4 mile north of southwest section corner, northwest quarter of southwest quarter Sec. 19, T10N, R12W, Hall County, Nebraska.
Topographic position: Terrace along Platte River.
Drainage: Good, surface and internal.
Land use: Irrigated corn in 1950.
Described by: B. H. Williams.
Date: July 7, 1950.

Horizon and
Mandan
Lab. Number

A1p 0 to 6 inches Very dark brown (10YR 2/2 moist) friable silt loam; gray

SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Wood River silt loam

SOIL NO. S51Nebr-40-6-(1-6)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2 (<19mm)	TEXTURAL CLASS
911	0-11	A1	0.1	0.2	0.3	1.7	15.2	63.2	19.3	18.8	60.6	-	sil
912	11-16	A2	0.2	0.4	0.6	7.1	14.2	61.6	15.9	20.5	59.0	-	sil
913	16-23	B2	-	0.2	0.4	1.0	10.2	46.2	42.0	15.5	41.5	-	sic
914	23-27	B3	0.1	0.1	0.2	0.5	9.3	48.0	41.8	17.2	40.4	-	sic
915	27-42	Bca	0.1	0.1	0.2	0.6	13.1	51.3	34.6	20.2	44.6	-	sicl
916	42-60	C1	1.4	0.8	0.4	1.0	14.2	55.1	27.1	22.3	47.6	3a	sicl-sil

	pH			ORGANIC MATTER			8A2 EST. % SALT (BUREAU CUBA.)	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS (per cent)		
	SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS. 4B2
	5.8	6.3	6.7	2.32			-	0.6	tr	-			11.1
	6.3	7.4	7.5	1.19			-	0.7	tr	-			7.4
	7.5	8.3	8.6	0.70			-	1.9	tr	-			21.8
	8.0	8.7	9.0	0.39			0.22	3.4	tr	-			22.4
	7.8	7.9	8.1	0.20			0.38	8.0	2	153			20.6
	7.8	8.2	8.5	0.12			0.36	7.5	4	6			16.2

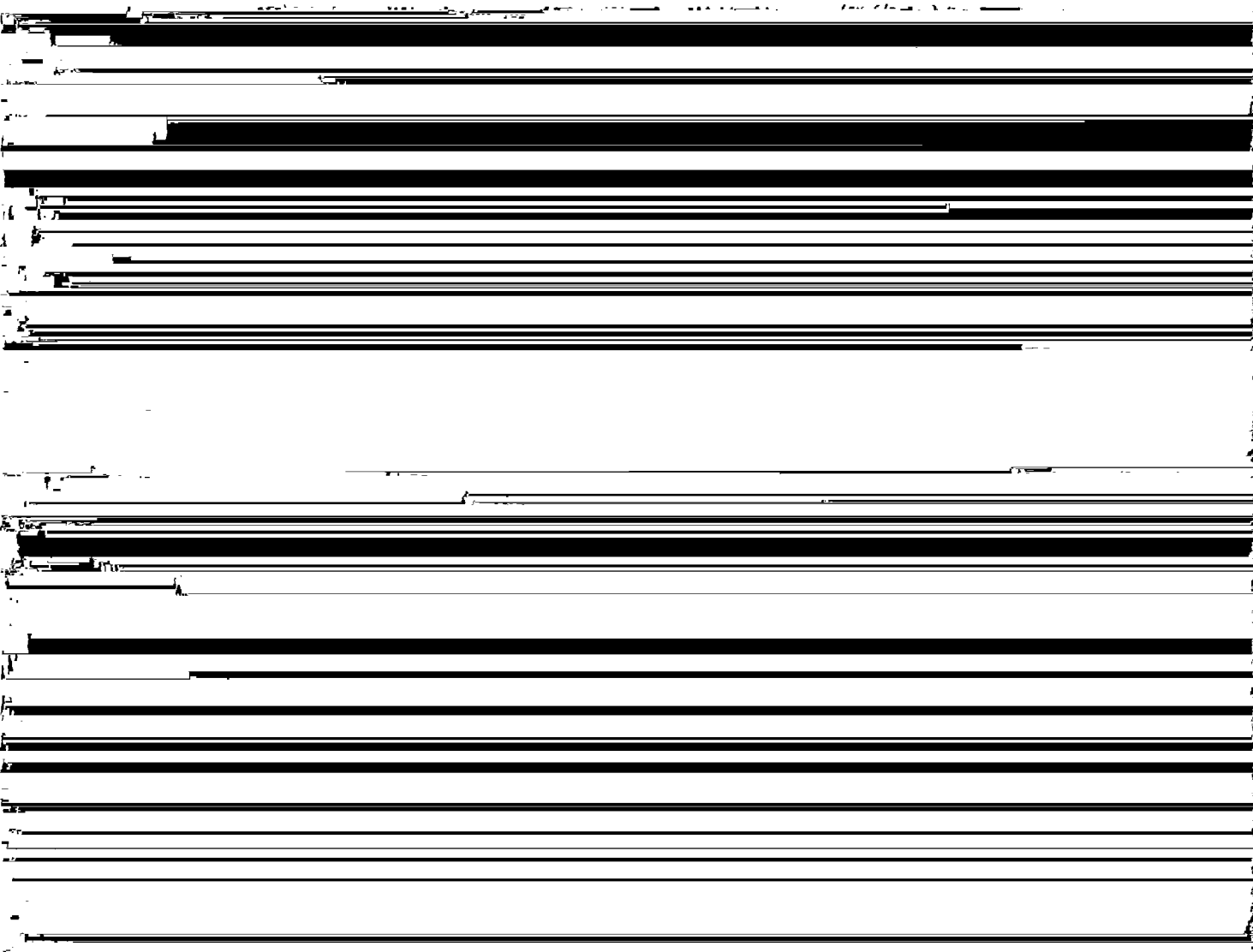
	5A1a CATION EXCHANGE CAPACITY $-NH_4OAc$	5B1a CATIONS EXTRACTABLE EXCHANGEABLE Ca 6N2b	Mg 6O2b	Na 6P2a	K 6Q2a	5B1b EXCHANGEABLE SODIUM PERCENTAGE ESP	5D2 SATURATION EXTRACT SOLUBLE 8A1 Na 6P1a	K 6Q1a	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
	← milliequivalents per 100g soil →						← milliequivalents per liter →						
	19.2	9.4	3.6	0.2	1.6	1	1.3	0.9					51.2
	14.2	6.0	3.0	0.8	1.7	6	4.8	0.4					39.4
	29.2	8.4	10.3	5.8	4.1	20	17.0	1.2					79.2
	32.9	10.4	14.5	7.5	4.8	23	28.7	1.5					113.4
	26.0			4.5	3.5	17	67.0	4.2					75.6
	25.7			4.0	3.5	16	65.0	4.2					64.5

a. Largely calcareous concretions.

AGR-SCS BELTSVILLE, MD 2682 JUNE 1953

Soil type: Wood River silt loam
Soil No.: S51Nebr-40-6-(1-6)
Location: 500 feet east and 300 feet north of SW corner, Sec. 22, T11N, R11W, Hall County, Nebraska.
Vegetation: Native pasture; grama, western wheat grass and buffalo grass dominant.
Parent material: Loess.
Physiographic position: Nearly level flat in very gently undulating terrace plain.
Topography: Nearly flat.
Slope: Less than one percent.
Erosion: None or slight.
Drainage: Slow.
Moisture: Moist.
Stoniness: Free.
Root distribution: Good.
Described by: B. H. Williams.
Date: October 8, 1951.
Mandan

Lab.No.	Horizon	
911	A1	0-11 inches. Silt loam; dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist) friable, medium granular silt loam.
912	A2	11-16 inches. Silt loam; gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist); weak prismatic silt loam; crushes easily to medium crumb or soft granular mass. The primary structure aggregates are heavily coated with gray leached silt.
913	B2	16-23 inches. Silty clay; grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) grading to olive brown or dark olive brown in the lower part. The upper part of this layer has strongly developed columnar-prismatic structure with heavy coating of shiny nearly black organic colloids on the surface of the columns. The lower 3 inches of the columns are less well defined and become blocky where they grade with the next layer below. The column tops are only slightly rounded, are coated with a 1/4-inch degrading, partly leached, slightly lighter colored layer, and sharply contact the A2 above. The columns are very hard when dry, very firm moist and plastic when wet. They merge gradually with the layer below.
914	B3	23-27 inches. Silty clay; light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist). Medium blocky; plastic, wet; firm, moist; hard, dry; changes rather abruptly to the next layer below.



SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Wood River silt loam

SOIL NO. S51Nebr-40-8-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 >2 (<19mm)	TEXTURAL CLASS
925	0-6	A1p	0.1	0.2	0.6	1.6	19.3	60.7	17.5	16.3	64.7	-	sil
926	6-11	A12	0.1	0.2	0.5	1.7	20.5	60.1	16.9	15.7	66.0	-	sil
927	11-13	A2	0.1	0.2	0.5	1.4	17.7	65.7	14.4	19.1	65.2	-	sil
928	13-18	B2	-	0.2	0.3	1.0	12.5	49.7	36.3	15.5	47.2	-	sicl
929	18-27	B3	0.1	0.2	0.5	1.0	11.6	49.0	37.6	17.4	43.7	-	sicl
930	27-31	Bca-cs	0.1	0.2	0.6	1.1	13.4	51.3	33.3	21.2	44.1	-	sicl
931	31-51	C1	0.1	0.3	0.6	1.8	18.1	54.3	24.8	22.2	51.1	-	sil
932	51-60	C2	0.2	0.4	0.5	1.5	17.4	60.3	19.7	24.4	54.0	2a	sil

	pH			ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	CaCO3	GYPSUM	MOISTURE TENSIONS (per cent)		
	SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N	EST. % SALT (BUREAU CUP)[1]	EC x 10 3 MILLIMHOS PER CM 8A1a	equivalent per cent 6E1a	me /100g SOIL 6F1a	1/10 ATMOS.	1/3 ATMOS	15 ATMOS. 4B2
	6.6	7.3	7.3	1.48			-	0.7	tr	-			8.2
	6.5	7.2	7.4	1.32			-	0.6	tr	-			8.3
	7.0	7.9	8.2	0.92			-	0.7	tr	-			6.8
	7.4	8.5	8.7	0.76			-	0.9	tr	-			19.0
	8.0	9.0	9.2	0.44			-	1.8	12	-			21.5
	7.8	7.9	8.0	0.20			0.27	5.2	3	74			18.9
	8.0	8.8	9.1	0.10			0.21	3.1	0	-			14.7
	7.9	9.3	9.5	0.10			0.20	3.1	2	-			10.3

	5A1a CATION EXCHANGE CAPACITY	5B1a CATIONS EXTRACTABLE Ca 6N2b	Mg 6O2b	5B1b EXCHANGEABLE Na 6P2a	K 6Q2a	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1 6P1a Na	6Q1a K	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
	← NH_4OAc milliequivalents per 100g soil →						← milliequivalents per liter →						
	16.0	9.5	3.3	0.3	1.6	2	1.3	0.4					41.8
	15.8	9.1	3.4	0.5	1.6	3	1.7	0.4					41.6
	12.8	6.6	3.3	1.2	1.5	9	4.8	0.1					38.0
	26.2	10.5	10.0	4.2	2.9	16	8.0	0.1					60.7
	27.8			4.4	3.2	16	14.1	0.6					82.2
	26.3			3.3	2.8	12	33.0	2.4					73.0
	25.2	11.6	10.6	5.5	2.9	22	27.6	1.2					55.7
	23.2			4.9	2.7	21	27.6	1.2					50.1

a. Largely calcareous concretions.

AGRI-SCH BELTSVILLE, MD 2682 JUNE 1953

Soil type: Wood River silt loam
Soil No.: S51Nebr-40-8-(1-8)
Location: 100 feet north and 50 feet west of SE corner, Sec. 32, T12N, R11W, Hall County, Nebraska.
Vegetation: Irrigated corn, apparent yield about 100 bushels per acre.
Parent material: Loess.
Physiographic position: Terrace (stream slope).
Topography: Undulating plain.
Slope: One percent.
Erosion: None to slight.
Drainage: Medium good.
Moisture: Moist.
Stoniness: None.
Root distribution: Good.
Described by: B. H. Williams.
Date: October 9, 1951.
Mandan

Lab.No.	Horizon	
925	A1p	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam; fine granular, soft, friable.
926	A12	6-11 inches. Same as above except medium blocky-fine granular structure.
927	A2	11-13 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; medium blocky with nearly white coating along the structure planes and light streaks through the blocks. Rests abruptly on layer below.
928	B2	13-18 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) prismatic blocky silty clay; the prisms are coated with very dark brown (10YR 2/2 moist) colloidal organic matter and have a glazed sheen; very hard, dry; stiff plastic, moist; sticky when wet.
929	B3	18-27 inches. Grayish brown (2.5Y 5/2 dry) to dark grayish brown (2.5Y 4/2 moist) medium blocky, heavy silty clay loam or silty clay. Moderately friable, moist; moderately hard, dry; plastic when wet.
930	Bca-cs	27-31 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) silty clay loam; weak blocky structure; abundant salt and lime accumulation; friable at wide moisture range.
931	C1	31-51 inches. Pale yellow (2.5Y 7/4 dry) to light olive brown (2.5Y 4.5/4 moist) massive friable silt loam; no effervescence with dilute HCl, except on occasional fine spot or streak.
932	C2	51-60 inches. Same as above, except a few more lime spots and a few large hard concretions.
	C3	60-96 inches. Color as above; massive; calcareous; a few small, brown and strong brown mottlings.
	C4	96-120 inches. Little or no change from above except more pronounced mottlings, including some gray.

Note: The C horizons at this location have bright yellowish color, whereas the Wood River (profile S51Nebr-40-6) has dull chroma within the olive or gray range and is more strongly mottled.

SOIL SURVEY LABORATORY

Mandan, North Dakota

SOIL TYPE Wood River silt loam

SOIL NO. S51Nebr-40-10-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	2A2 > 2 (<19mm)	TEXTURAL CLASS
941	0-9	A1	0.1	0.2	0.6	1.3	19.3	58.6	19.9	16.9	61.8	-	sil
942	9-14	A2	-	0.3	0.7	3.1	18.3	58.0	19.6	17.3	59.7	-	sil
943	14-21	B21	0.1	0.2	0.5	1.1	10.5	52.0	35.6	16.6	46.3	-	sicl
944	21-32	B22	-	0.2	0.6	2.7	5.3	58.0	33.2	21.3	43.6	-	sicl
945	32-36	C1cacs	0.1	0.3	1.4	4.2	18.5	51.2	24.3	13.0	57.7	-	sil
946	36-44	C2	-	0.1	0.3	0.5	10.6	49.2	39.3	25.9	34.2	-	sicl
947	44-54	C2	0.3	0.3	0.3	0.8	5.8	64.5	28.0	31.8	38.7	-	sicl
948	54-60	C3	0.2	0.2	0.5	1.4	19.1	56.9	21.7	14.7	62.0	1a	sil

LABORATORY NUMBER	pH SATURATED PASTE 8C1b	pH 1:5 8C1a	pH 1:10 8C1a	ORGANIC MATTER % ORGANIC CARBON 6A1a	ORGANIC MATTER % NITROGEN	C/N	8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 3 MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6E1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS 1/10 ATMOS.	(per cent) 1/3 ATMOS.	15 ATMOS. 4B2
	6.5	7.0	7.2	1.57			-	0.8	tr	-			6.7
	6.9	7.9	7.9	1.09			-	0.8	tr	-			8.6
	7.3	8.2	8.3	0.83			-	0.8	tr	-			19.0
	8.1	9.0	9.2	0.42			-	2.0	1	-			18.8
	7.9	8.0	8.1	0.29			0.36	6.0	3	29			15.4
	7.8	8.8	9.2	0.26			0.22	5.3	2	-			14.2
	8.0	9.0	9.1	0.34			0.25	4.5	2	-			18.3
	8.0	9.1	9.3	0.18			-	4.0	1	-			12.6

LABORATORY NUMBER	5A1a CATION EXCHANGE CAPACITY NH4OAc	5B1a CATIONS EXTRACTABLE Ca 6N2b	EXTRACTABLE Mg 6O2b	EXCHANGEABLE Na 6P2a	EXCHANGEABLE K 6Q2a	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1 Na 6P1a	K 6Q1a	CO_3	HCO_3	Cl	SO_4	8A PER CENT MOISTURE AT SATURATION
		milliequivalents per 100g soil →					← milliequivalents per liter →						
	16.6	10.0	3.1	0.4	1.9	2	2.8	1.5					41.6
	15.7	8.6	4.3	1.2	1.7	8	5.9	0.4					41.1
	26.6	12.0	8.8	3.0	3.5	11	6.5	0.4					57.6
	27.0		9.3	3.6	4.1	13	16.3	1.5					75.0
	23.5			3.5	3.9	15	40.0	4.5					58.2
	21.7			3.7	3.6	17	37.6	4.0					50.2
	23.8			4.3	4.1	18	37.2	3.3					55.4
	21.9			4.0	3.8	18	32.0	2.9					49.1

a. Largely calcareous concretions.

AGR SCS-BELTSVILLE, MD 2002 JUNE 1959

Soil type: Wood River silt loam
Soil No.: 851Nebr-40-10-(1-8)
Location: 1250 feet east and 100 feet north of SW corner, Sec. 32, T12N, R11W, Hall County, Nebraska.
Vegetation: Cultivated oat stubble.
Parent material: *Loess.*
Physiographic position: Terrace.
Topography: Gently undulating plain.
Slope: Less than 1 percent.
Erosion: None or slight.
Drainage: Slow.
Moisture: Moist.
Described by: B. H. Williams.
Date: October 9, 1951.

Mandan Lab.No.	Horizon	
941	A1	0-9 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam; friable; soft granular.
942	A2	9-14 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam (broken surface of structure aggregates); medium to coarse blocky; light gray silt coating on outer surface of the blocks; vesicular; friable. Fairly abrupt break to the next horizon.
943	B21	14-21 inches. Grayish brown (10YR 5/2 dry) to very dark brown, broken surface, (10YR 2/3 moist) heavy silty clay loam (10YR 3/3 crushed) and (10YR 2/2 on the surface of the aggregates); coarse prismatic primary and medium blocky secondary structure; moderately friable moist; moderately hard dry; moderately plastic wet.
944	B22	21-32 inches. Grayish brown (2.5Y 5.5/2 dry) to dark grayish brown (2.5Y 4/2 moist) silty clay loam; blocky; friable moist; moderately hard dry.
945	C1ca-cs	32-36 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) heavy silt loam or silty clay loam; massive; friable; high in lime and other salts.
946	C2	36-44 inches. Color as above; silt loam; massive; friable; calcareous, including streaks and spots of segregated lime.
947	C2	44-54 inches. Grayish brown (2.5Y 5/2 dry) to dark grayish brown (2.5Y 3.5/2 moist) silt loam; massive; friable; calcareous, including segregated lime mainly in the form of soft concretions. This is an incipient buried soil.
948	C3	54-60 inches. Light brownish gray (2.5Y 6.5/2 dry) to dark grayish brown (2.5Y 4/2 moist) silt loam; massive; friable; calcareous; some segregated lime.

SCS 421
10-64

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Wymore silty clay loam SOIL Nos. S60Nebr-55-1 LOCATION Lancaster County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 14255-14262 December 1964

Depth (In.)	Horizon	1B1a Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (<0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)			Coarse fragments: 2A2 ≥2 Pct	Coarse fragments: 2-19 Pct. of <76mm	Coarse fragments: 19-76 Pct. of <76mm
		Pct of <2 mm																
0-7	Ap	3.8	68.3	27.9	-	0.2a	0.3a	0.5a	2.8	40.9	27.4	43.9	1.0			-	-	
7-11	A3	3.6	65.5	30.9	0.1a	0.2a	0.3a	0.6a	2.4b	36.6	28.9	39.3	1.2			-	-	
11-16	B21	2.1	46.6	51.3	0.1a	0.1a	0.1a	0.2a	1.6b	23.0	23.6	24.7	0.5			-	-	
16-28	B22	2.0	52.0	46.0	0.1a	0.1a	-	0.2a	1.6b	24.8	27.2	26.5	0.4			-	-	
28-33	B3ca	3.5	55.6	40.9	0.6c	0.6d	0.2d	0.4d	1.7e	26.0	29.6	27.9	1.8			tr.	tr.	
33-44	Cca	3.4	62.3	34.3	0.2c	0.2d	0.2d	0.4d	2.4e	31.0	31.3	33.6	1.0			tr.	tr.	
44-52	C1	3.0	65.5	31.5	-	0.1a	0.2a	0.4b	2.3	31.7	33.8	34.2	0.7			-	-	
52-60	C2	3.0	65.8	31.2	-	0.1a	0.1a	0.4b	2.4	34.3	31.5	36.9	0.6			tr.	tr.	

Depth (In.)	6A1a Organic carbon f Pct	6B1a Nitrogen Pct	C/N		6E1c Carbonate as $CaCO_3$ Pct.	6C1a Ext. Iron as Fe Pct.	Bulk density: 4A1a Field-State g/cc	Bulk density: 4A1c 30-Cm. g/cc	Bulk density: 4A1h Oven-Dry g/cc	4D1 Extensibility in per horizon	Water content: 4B4 Field-State Pct	Water content: 4B3 30-Cm. Pct.	Water content: 4B1b 1/3-Bar Pieces Pct.	Water content: 4B2 15-Bar Pct.	4C1 1/3- to 15-Bar in per horizon	pH		8C1a (1:1)
0-7	1.53	0.126	12			0.7							22.5	12.6				5.2
7-11	1.09	0.095	12			0.7	1.47	1.36	1.47g	0.11	7.2	26.8	23.2	13.9	0.5			5.6
11-16	0.87	0.068	13			0.8	1.84g	1.34	1.86g	0.52	8.5	31.2	29.3	22.9	0.4			6.5
16-28	0.59	0.052	11			0.7	1.88	1.42	1.92g	1.15	9.0	28.2	29.7	20.8	1.6			7.3
28-33	0.28				2	0.6	1.84	1.40	1.85g	0.44	8.2	28.3	30.3	19.6	0.8			7.8
33-44	0.16				1	0.7	1.58	1.36	1.63g	0.66	10.6	31.1	29.0	18.4	1.5			7.7
44-52	0.15				tr.	0.8	1.59	1.36	1.61g	0.45	6.6	32.1	29.3	17.3	1.3			7.7
52-60	0.16				tr.	0.8	1.52	1.37	1.59g	0.39	15.0	32.6	29.8	16.9	1.4			7.7

Depth (In.)	Extractable bases 5B1a: 6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	5B1a Sum	6H1a Ext. Acidity	Cat. Exch. Cap.: 5A3a Sum Cations	5A1a NH_4OAc	8D3 Ca/Mg	Base saturation: 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g										
0-7	10.9	4.1	0.1	0.5	15.6	9.8	25.4	19.6	2.6	61	80
7-11	12.3	5.3	0.3	0.4	18.3	8.1	26.4	20.6	2.3	69	89
11-16	23.1	11.2	1.2	0.8	36.3	5.4	41.7	33.6	2.1	87	108
16-28	22.5	10.8	1.7	0.7	35.7	2.8	38.5	31.9	2.1	93	112
28-33			1.9	0.8				29.8			
33-44			2.0	0.9				28.2			
44-52			2.1	0.9				25.9			
52-60			2.1	0.9				25.9			

Depth (In.)	Ratios to Clay 8D1: NH_4OAc CEC	Ext. Iron	15-Bar Water
0-7	.70	.025	.45
7-11	.67	.023	.45
11-16	.65	.016	.45
16-28	.69	.015	.45
28-33	.73	.015	.48
33-44	.82	.020	.54
44-52	.82	.025	.55
52-60	.83	.026	.54

a. > 50% Fe-Mn nodules.
b. 5-25% Fe-Mn nodules.
c. > 50% Carbonate nodules.
d. > 50% Carbonate nodules. 5-25% Fe-Mn nodules.
e. 5-25% Carbonate nodules.
f. 11 Kg/m^2 to 60 inches.
g. One clod.

Soil type: Wymore silty clay loam
Soil No.: SCONebr-55-1
Classification: Maximal Chernozem.
Location: 332 feet west and 225 feet south of the northeast corner of the southwest quarter Sec. 34, T8N, R8E.

Crop: Sorghum.
Parent material: Peorian loess.
Climate: Subhumid.
Physiography: Nearly level loess upland.
Relief: Subnormal.
Slope: 1 percent.
Aspect: Essentially level with 1 percent slope toward the northwest.
Erosion: Variable.
Permeability: Moderately slow.
Drainage: Moderately well drained.
Ground water: Deep.
Moisture: Near field capacity.
Root distribution: A few root channels were observed extending through the profile to the C horizon.
Described by: Joseph M. Downs.

LSL No.	Horizon	
14255	Ap	0 to 7 inches. Very dark gray (10YR 3/1 moist uncrushed) (10YR 5/2 dry) silty clay loam, weak fine granular structure, friable, no effervescence; abrupt smooth lower boundary.
14256	A3	7 to 11 inches. Very dark brown (10YR 2/2 moist uncrushed) (10YR 3/2 moist crushed) (10YR 6/2 dry) silty clay loam, moderate very fine subangular blocky structure, friable, no effervescence; abrupt smooth lower boundary; a very few fine brown mottles occur in the upper portion of this horizon.
14257	B21	11 to 16 inches. Very dark grayish brown (10YR 3/2 moist uncrushed) (2.5Y 4/2 moist crushed) (10YR 4/2 dry) silty clay, moderate fine subangular blocky breaking to very fine subangular blocky, common thin continuous clay films, firm, no effervescence, few fine medium hard dark brown to black concretions, few fine faint black and brown mottles; clear smooth lower boundary.
14258	B22	16 to 28 inches. Dark grayish brown (2.5Y 4/2 moist uncrushed) (10YR 6/2 dry) silty clay, moderate medium subangular blocky breaking to fine subangular blocky, common thin continuous clay films, firm, no effervescence, few fine medium hard dark brown to black concretions; abrupt wavy lower boundary.
14259	B3ca	28 to 33 inches. Dark grayish brown (2.5Y 4/2 moist uncrushed) (10YR 6/2 dry) silty clay, weak coarse subangular blocky, few discontinuous clay films, firm, common hard $CaCO_3$ concretions, no effervescence in matrix material; clear wavy lower boundary.
14260	Cca	33 to 44 inches. Olive gray (5Y 5/2 moist uncrushed) (10YR 7/2 dry) silty clay loam, many fine distinct mottles (10YR 4/3 moist), few distinct fine very dark brown to black mottles, massive, friable, common hard $CaCO_3$ concretions, very weak effervescence in matrix material; gradual wavy lower boundary.
14261	C1	44 to 52 inches. Olive gray (5Y 5/2 moist uncrushed) (10YR 7/2 dry) silty clay loam, many medium distinct mottles (10YR 4/3 moist), few distinct fine very dark brown to black mottles, massive, friable, no effervescence; smooth gradual lower boundary.
14262	C2	52 to 60 inches. Olive gray (5Y 5/2 moist uncrushed) (10YR 7/2 dry) silty clay loam, many medium distinct mottles (10YR 4/3 moist), massive, friable, no effervescence.

SCS-421
10-64

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Wymore silty clay loam SOIL Nos. 861Nebr-55-1 LOCATION Lancaster County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB Nos. 14485-14492 December 1964

Depth (in)	Horizon	1B1a Total Sand (2-0.05)	Silt (0.05-0.002)	Clay (< 0.002)	Size class and particle diameter (mm) 3A1 Sand: Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Silt: 0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	Coarse fragments 2A2 > 2 Pct	2-19 Pct of < 76mm	19-76 Pct of < 76mm
		Pct of < 2 mm														
0-7	Ap	5.8	59.9	34.3	-	0.2a	0.2a	0.4a	5.0	38.0	21.9	43.2	0.8	-	-	
7-11	A3	3.6	48.1	48.3	0.1a	-	0.1a	0.2a	3.2	25.4	22.7	28.7	0.4	-	-	
11-18	B21	3.1	46.8	50.1	-	-	-	0.1a	3.0	24.8	22.0	27.9	0.1	-	-	
18-25	B22	3.2	51.7	45.1	-	-	-	0.2b	3.0	26.7	25.0	29.8	0.2	-	-	
25-33	B3ca	4.2	62.5	33.3	0.6c	0.2c	0.1c	0.3d	3.0e	31.8	30.7	35.0	1.2	tr.	tr.	
33-45	Cca	4.7	57.3	38.0	0.8c	0.2c	0.1c	0.3d	3.3e	28.3	29.0	31.8	1.4	tr.	tr.	
45-52	C1	3.1	64.1	32.8	-	-	-	0.3d	2.8e	33.3	30.8	36.3	0.3	-	-	
52-60	C2	4.0	61.7	34.3	-	-	-	0.3d	3.7e	31.6	30.1	35.5	0.3	-	-	

Depth (In)	6A1a Organic carbon Pct	6B1a Nitrogen Pct	C/N		6E1c Carbonate as $CaCO_3$ Pct.	6C1a Ext. Iron as Fe Pct.	Bulk density g/cc	g/cc	g/cc	Water content Pct	4B1b 1/3-Bar Pieces Pct	4B2 15-Bar Pct.	pH		8C1a (1:1)
0-7	1.98	0.164	12			0.7					24.6	13.0			5.4
7-11	1.24	0.086	14			1.0					33.4	19.8			5.8
11-18	0.93	0.076	12		-	0.8					34.0	21.6			6.7
18-25	0.79	0.070	11		-	0.8					32.9	20.1			7.2
25-33	0.22				1	0.8					32.6	16.4			7.7
33-45	0.34				2	0.8					33.2	18.4			7.7
45-52	0.20				tr.	0.9					34.8	15.5			7.8
52-60	0.22				tr.	0.8					35.2	16.0			7.9

Depth (In)	Extractable bases 5B1a 6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	5B1a Sum	6H1a Ext. Acidity	Cat. Exch. Cap. 5A3a Sum Cations	5A1a NH_4OAc	8D3 Ca/Mg	Base saturation 5C3 Sum Cations Pct	5C1 NH_4OAc CEC Pct.
	meq/100 g										
0-7	13.3	5.5	0.2	0.7	19.7	11.2	30.9	23.4	2.4	64	84
7-11	19.1	10.2	1.0	0.9	31.2	9.3	40.5	32.1	1.9	77	97
11-18	21.2	11.9	1.5	0.9	35.5	5.8	41.3	33.3	1.8	86	107
18-25	20.7	10.8	1.8	0.9	34.2	3.0	37.2	32.0	1.9	92	107
25-33			2.7	0.9				27.1			
33-45			2.2	0.9				28.7			
45-52			2.6	0.9				25.8			
52-60			2.7	0.9				26.8			

Depth (In.)	Ratios to Clay 8D1 NH_4OAc CEC	Ext. Iron	15-Bar Water
0-7	.68	.020	.38
7-11	.66	.021	.41
11-18	.66	.016	.43
18-25	.71	.018	.44
25-33	.81	.024	.49
33-45	.76	.021	.48
45-52	.79	.027	.47
52-60	.78	.023	.47

a. > 50% Fe-Mn nodules.
b. 5-25% Fe-Mn nodules.
c. > 50% Carbonate nodules.
d. 5-25% Carbonate nodules. 5-25% Fe-Mn nodules.
e. 5-25% Carbonate nodules.

Soil type: Wymore silty clay loam
Soil No.: 861Nebr-55-1
Classification: Maximal Chernozem.
Location: 2 miles west and 450 feet north of the southeast corner Sec. 20, T7N, R8E, Lancaster County, Nebraska

Crop: Alfalfa.
Parent material: Peorian loess.
Climate: Subhumid.
Physiography: Narrow, nearly level loess upland.
Relief: Subnormal.
Slope: 1 percent.
Erosion: Moderate.
Permeability: Moderately slow.
Drainage: Moderately well drained.
Ground water: Deep.
Moisture: Below field capacity.
Root distribution: A few roots extending to the C2. Largest alfalfa roots from surface through B22. Land owner indicated no fertilizer was applied.
Described by: Joseph M. Downs.

LSL No.	Horizon	
14485	Ap	0 to 7 inches. Silty clay loam (10YR 3/1) weak fine granular structure, friable, no effervescence; abrupt smooth lower boundary.
14486	A3	7 to 11 inches. Silty clay loam (10YR 2/2 uncrushed) (10YR 3/2 crushed) moderate very fine subangular blocky, friable, no effervescence; clear smooth lower boundary, few fine brown mottles occur in this horizon.
14487	B21	11 to 18 inches. Silty clay (10YR 3/2 uncrushed) (2.5Y 4/2 crushed) moderate fine subangular blocky breaking to fine subangular blocky, common continuous thin clay films, firm, no effervescence, few brown mottles; gradual smooth lower boundary.
14488	B22	18 to 25 inches. Silty clay (2.5Y 4/2) moderate medium subangular blocky breaking to fine subangular blocky, common continuous thin clay films, firm, no effervescence, few fine medium hard dark brown concretions; abrupt wavy lower boundary.
14489	B3ca	25 to 33 inches. Silty clay (2.5Y 4/2) weak coarse subangular blocky, few discontinuous clay films, firm, common hard $CaCO_3$ concretions, no effervescence; gradual wavy lower boundary.
14490	Cca	33 to 45 inches. Silty clay loam (2.5Y 5/2) many medium distinct mottles (10YR 5/3); brown color is more distinct than in lower horizons, friable, very weak effervescence, common hard $CaCO_3$ concretions, common $CaCO_3$ coatings on broken clod surfaces; gradual smooth lower boundary.
14491	C1	45 to 52 inches. Silty clay loam (2.5Y 5/2) many medium distinct mottles (10YR 5/3), massive, friable, very weak effervescence, occasional small hard $CaCO_3$ concretions, occasional fine $CaCO_3$ coatings on broken clod faces; gradual smooth lower boundary.
14492	C2	52 to 60 inches. Silty clay loam (2.5Y 5/2) many medium distinct mottles (10YR 5/3), massive, friable, very weak effervescence, occasional small hard $CaCO_3$ concretions, about equal amounts of 2.5Y 5/2 and 10YR 5/3 colors exist in the C horizon, other intermediate colors are present; brown colors appear somewhat as horizontal streaks.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1959

SOIL TYPE Wymore silty clay loam **LOCATION** Pawnee County, Nebraska

SOIL NOS. S58Nebr-67-2-(1-9) **LAB. NOS.** 9139-9147

DEPTH INCHES	HORIZON	1N1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1 VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-5	A1p	<0.1	0.1	0.2a	0.4a	1.3a	57.6	40.4	32.1	27.0	-	sic/sicl
5-12	B1	<0.1	<0.1	0.1a	0.2a	0.8a	51.5	47.4	25.4	27.0	-	sic
12-20	B21	<0.1	<0.1	0.1a	0.1a	0.6a	53.2	46.0	24.1	29.8	-	sic
20-28	B22	<0.1	<0.1	<0.1	<0.1	0.5b	58.2	41.3	26.8	31.9	-	sic
28-37	B23	<0.1	<0.1	<0.1	<0.1	0.5b	62.6	36.9	28.1	35.0	-	sicl
37-46	C	<0.1	<0.1	<0.1	<0.1	0.5b	63.9	35.6	27.0	37.4	-	sicl
46-50	D1	<0.1	<0.1	<0.1	<0.1	0.5b	65.5	34.0	24.6	41.4	-	sicl
50-54	D2	0.9c	2.6c	3.2a	4.7a	3.2a	54.1	31.3	28.1	31.6	-	sicl
54-63	D3	1.0c	3.1c	3.6a	5.3a	3.6a	49.8	33.6	27.4	28.6	-	sicl

pH 8C1a 1:1	1:5	1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	6C1a Free Iron as Fe_2O_3 %	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %
6.3			1.84	0.153	12.0	1.2	0.4					16.8
5.8			1.48	0.116	12.8	1.3	0.3					20.5
5.9			0.78	0.066	12	1.2	0.3					19.9
6.1			0.43	0.048	9	1.2	0.3					18.9
6.4			0.22			1.0	0.3					17.8
6.6			0.21			1.5	0.3	<1				17.5
6.7			0.20			2.0	0.3	<1				16.7
6.7			0.19			1.2	0.3	<1				12.9
6.7			0.21			1.5	0.3	<1				14.1

5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	BASE SAT. % NH_4Ac EXCH. 5C1	8A1, SAT.EXT.SOL. 6P1a Na	6Q1a K	4B4 Field State Water %	4A1a Vol. Wt. g/cc	8A MOISTURE AT SATURATION %
←	milliequivalents per 100g. soil →						← me. per liter →				
29.0	23.0	5.8	6.6	<0.1	0.6	101	0.4	0.1			63.3
33.2	23.5	7.6	7.6	0.1	0.5	95	0.5	0.1			79.1
31.7	23.8	8.1	6.2	0.2	0.7	103	0.6	0.1	29.2	1.40	82.0
31.3	22.6	7.7	4.6	0.2	0.6	99	0.6	0.1			82.3
28.9	21.6	7.0	3.3	0.3	0.6	102	0.8	0.1	24.9	1.50	75.8
28.5	21.2	6.9	3.7	0.4	0.5	102	0.9	<0.1			73.1
26.2	20.4	6.3	2.5	0.4	0.5	105	1.0	<0.1			65.8
21.6	16.0	4.6	2.4	0.3	0.3	98	1.1	<0.1			51.2
17.3	16.4	4.9	2.9	0.3	0.3	126	1.0	<0.1	21.9	1.49	56.3

a. Few smooth light to dark brown concr. (Fe?)
b. Common smooth light to dark brown concr. (Fe?)
c. Trace smooth light to dark brown concr. (Fe?)

Soil Type: Wymore silty clay loam
Classification: Brunizem
Location: 300 feet south and 110 feet east of center of Sec. 10, T1N, R11E, about 1 mile west and 3 miles south of Pawnee City, Pawnee County, Nebraska.
Date Sampled: September 11, 1958.
Collectors: R. Jordan, J. Elder, M. James.
Use: Cultivated (lespedeza 1958).
Climate: Average annual precipitation 31 inches; average annual temperature 53° F.
Parent Material: Loess.
Physiography: Loess-capped glacial upland.
Slope: 2 percent southwest.
Soil No.: S58Nebr-67-2-(1-9)
Lincoln

Lab.No.	Horizon	
9139	A1p	0-5 inches. Very dark brown (10YR 2/2 dry) to very dark brown (10YR 2/2 moist) silty clay loam; moderate fine granular structure; slightly hard dry, friable, moist; noncalcareous; abrupt smooth lower boundary.
9140	B1	5-12 inches. Very dark grayish brown (10YR 3/2 dry) to very dark brown (10YR 2/2 moist) silty clay; moderate fine blocky structure; hard, dry, firm moist; noncalcareous; gradual smooth lower boundary.
9141	B21	12-20 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9142	B22	20-28 inches. Grayish brown (2.5Y 5/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay, a few fine faint yellowish brown mottles; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9143	B23	28-37 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam; a few fine distinct yellowish brown and dark brown mottles; moderate medium blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9144	C	37-46 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (2.5Y 4/2 moist) silty clay loam; many medium distinct yellowish brown and dark brown mottles; weak medium prismatic structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9145	D1	46-50 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) silty clay loam; weak medium subangular blocky structure; slightly hard dry, friable moist; noncalcareous; abrupt wavy lower boundary.
9146	D2	50-54 inches. Light brownish gray (10YR 6/2 dry) to dark brown (7.5YR 3/2 moist) silty clay loam; a few fine distinct dark reddish brown mottles; weak medium subangular blocky structure; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9147	D3	54-63 inches. Light brownish gray (10YR 6/2 dry) to dark brown (7.5YR 3/2 moist) silty clay loam; common fine distinct dark reddish brown mottles; weak medium granular structure; slightly hard dry, friable moist; noncalcareous.

Note: The D horizons are part of a Planosol in Sangamon weathered material. Weathered till was encountered at 6½ feet. Horizons A1p, B22 and D3 were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1959

SOIL TYPE Wymore silty clay loam **LOCATION** Pawnee County, Nebraska

SOIL NOS. S58Nebr-67-7-(1-8) **LAB. NOS** 9177-9184

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	3A1 0.02-0.002	2A2 > 2	TEXTURAL CLASS
0-5	A1p	<0.1	0.1a	0.2a	0.3a	1.4a	63.2	34.8	41.4	23.4	-	sicl
5-9	B1	<0.1	<0.1	0.1a	0.2a	0.7a	56.4	42.6	30.2	27.0	-	sic
9-17	B21	<0.1	<0.1	0.1b	0.2b	0.5a	52.4	46.8	25.0	28.0	-	sic
17-25	B22	<0.1	0.1b	0.1b	0.2b	0.5a	58.0	41.1	26.1	32.5	-	sic
25-32	B23	<0.1	0.1b	0.1b	0.1b	0.5a	59.3	39.9	27.9	32.0	-	sicl/sic
32-40	B24	<0.1	0.1b	0.1b	0.1b	0.4a	61.7	37.6	32.2	30.0	-	sicl
40-53	C	<0.1	<0.1	<0.1	<0.1	0.6a	65.0	34.4	32.8	32.8	-	sicl
53-63	D	0.2	1.9	2.5	4.4	2.8	58.6	29.6	30.5	33.0	-	sicl

DEPTH INCHES	HORIZON	pH 8C1a 1:1	pH 1:5	pH 1:10	ORGANIC MATTER 6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	6C1a Free Iron as %Fe_2O_3	ELECTRICAL CONDUCTIVITY EC×10³ MILLIMHOS PER CM 8A1a	6E1a $CaCO_3$ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS 1/10 ATMOS. %	1/3 ATMOS. %	4E2 15 ATMOS. %
0-5	A1p	5.6			2.09	0.163	12.8	1.0	0.3					14.5
5-9	B1	5.7			1.84	0.150	12.3	1.1	0.3					18.6
9-17	B21	5.9			1.24	0.095	13.0	1.2	0.3					20.4
17-25	B22	6.1			0.63	0.060	10	1.4	0.3					19.6
25-32	B23	6.3			0.38			1.4	0.3					18.6
32-40	B24	6.6			0.24			1.1	0.3	<1				18.2
40-53	C	6.8			0.15			0.5	0.3	<1				16.9
53-63	D	6.9			0.20			1.2	0.4	<1				12.8

DEPTH INCHES	HORIZON	5A1a CATION EXCHANGE CAPACITY NH_4Ac	EXTRACTABLE CATIONS 6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	5B1a BASE SAT. % NH_4Ac EXCH. 5C1	8A1 SATURATION EXTRACT SOL. 6P1a Na	6Q1a K	8A MOISTURE AT SATURATION %
		← milliequivalents per 100g. soil →							← milliequivalents per liter →		
0-5	A1p	26.6	17.2	4.7	9.8	0.1	0.8	86	0.4	0.2	56.6
5-9	B1	31.7	21.3	6.5	9.0	0.1	0.6	90	0.4	0.1	68.0
9-17	B21	34.0	23.8	7.3	7.4	0.2	0.7	94	0.6	0.1	72.4
17-25	B22	32.2	23.4	7.3	6.2	0.2	0.6	98	0.6	0.1	79.6
25-32	B23	30.2	22.8	6.9	4.5	0.3	0.6	101	0.8	0.1	77.7
32-40	B24	29.1	23.1	6.9	3.3	0.4	0.6	106	0.9	0.1	77.5
40-53	C	27.2	21.8	6.1	2.9	0.5	0.5	106	1.2	<0.1	66.9
53-63	D	21.3	17.3	4.4	3.2	0.5	0.3	106	1.5	<0.1	52.3

a. Few smooth and irregular dark brown to black concr. (Fe-Mn?)
b. Many smooth and irregular dark brown to black concr. (Fe-Mn?)

Soil Type: Wymore silty clay loam
Classification: Brunizem
Location: 1170 feet west and 580 feet south of NE corner Sec. 1, T1N, R11E, about 1 mile east and 1 mile south of Pawnee City, Pawnee County, Nebraska.
Date Sampled: September 16, 1958.
Collectors: J. Allen, J. Elder, R. Greenawalt.
Use: Cultivated (stubble).
Climate: Average annual precipitation 31 inches; average annual temperature 53° F.
Parent Material: Loess.
Physiography: Loess-capped glacial till upland.
Slope: 4 percent southwest.
Soil No.: S58Nebr-67-7-(1-8)

Lincoln Lab.No.	Horizon	
9177	A1p	0-5 inches. Dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist) silty clay loam; weak medium granular structure; slightly hard dry, friable moist;noncalcareous; abrupt smooth lower boundary.
9178	B1	5-9 inches. Very dark grayish brown (10YR 3/2 dry) to very dark brown (10YR 2/2 moist) heavy silty clay loam; moderate very fine blocky structure with clay films on the aggregate faces; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9179	B21	9-17 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay; moderate medium and fine blocky structure with clay films on the aggregate faces; hard dry, firm moist; noncalcareous; clear smooth lower boundary.
9180	B22	17-25 inches. Dark brown (10YR 4/3 dry) to dark grayish brown (10YR 4/2 moist) silty clay, a few fine faint dark yellowish brown mottles; moderate medium and fine blocky structure with clay films on the aggregate faces; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9181	B23	25-32 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silty clay; common fine faint dark yellowish brown mottles; moderate medium blocky structure with clay films on the aggregate faces; hard dry, firm moist; noncalcareous; clear smooth lower boundary.
9182	B24	32-40 inches. Mottles 50 percent grayish brown (2.5Y 5/2dry) to olive brown (2.5Y 4/4 moist), 50 percent light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) heavy silty clay loam; a few fine distinct yellowish brown mottles and common fine distinct reddish brown iron and manganese concretions; moderate medium and fine blocky structure with patchy clay films on the aggregate faces; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9183	C	40-53 inches. Light brownish gray (2.5Y 6/2 dry) to gray (5Y 5/1 moist) silty clay loam; weak medium and coarse blocky structure, a few small pipe-like iron concretions are present; slightly hard dry, friable moist; few scattered lime concretions; abrupt smooth lower boundary.
9184	D	53-63 inches. Brown (10YR 5/3 dry) to dark brown (7.5YR 4/2 moist) silty clay loam; weak fine platy structure; soft dry, very friable moist; noncalcareous.

Note: There are common fine distinct dark reddish brown mottles and also many fine pores present in the "D" horizon. The contact zone between the C and D horizons consists of thin lenses of dark colored material, probably organic stainings, also concentrations of yellowish brown iron stains. Horizons A1p, B22 and D were sampled for the Bureau of Public Roads.

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